NATIONAL CAR BUILDER

VOLUME XIV.
NUMBER 5.

DEVOTED TO THE INTERESTS OF RAILWAY ROLLING STOCK.

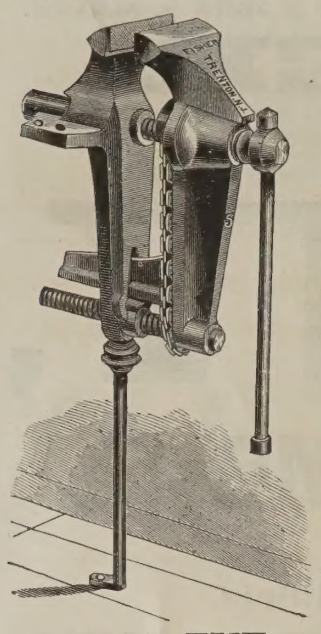
$1.00 PER ANNUM
SINGLE NUMBERS, TEN CENTS.

NEW YORK:
Morse Building, 140 Nassau St.

MAY, 1883.

ENTERED AT THE POST OFFICE AT NEW YORK N. Y., AS MAIL MATTER OF THE SECOND CLASS.

CHICAGO:
144 N. Clark Street.



Our NO. 6 VISE opens 10 inches, with 8-inch Jaws; has solid forged screws 1¾-inch diameter, with 26-inch lever. We make 5 smaller sizes of same pattern. Special discounts to R. R. Companies and Car Companies on application.

THE
FISHER DOUBLE-SCREW VISE.
FULLY WARRANTED.

Stronger than any other Leg Vise,
AND ALWAYS PARALLEL.

The Best Vise for R. R. Machine Shops and Car Builders, and for all heavy work.

Accurate and Durable.

MADE ONLY BY
THE EAGLE ANVIL WORKS,
TRENTON, N. J.

W. BAILEY LANG,
Sole Agent in the United States and Canadas for the
LOWMOOR
IRON COMPANY.

Bar Iron of great strength and uniform quality
Plate Iron unequaled for Fire Boxes.
Tyres, Axles, Chain Rivets, Angle and **T Iron** and **Forgings** of all descriptions.
STAY-BOLT IRON.
A full assortment of Bar Iron in store.
50 Beekman St., N.Y. **13** Custom House St., Boston

J. BERNARD.
MANUFACTURER OF
Marqueterie of every description; dealer in French Walnuts, Colored and any other Veneers, especially adapted for Car-Work.
161 Greene Street, N. Y

A GREAT IMPROVEMENT.
Ketcham's Positive Ferro-Prussiate, or
REVERSED BLUE PROCESS
paper gives dark blue lines on a white background on first impression, instead of white lines on blue background, as in the ordinary blue process paper, thus making the *altering* of lines or the *coloring* of any part of the drawing perfectly simple and easy.
Prices: in rolls of 11 yards in length by 30 in. wide, $4; 36 in., $5; 43 in., $6 per roll.

DRAUGHTSMEN'S MATERIALS.
Solar Printing and Blue Process Paper.
White and Manilla Drawing Paper in Sheets, Rolls or Mounted.
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Railroad Printers and Stationers,
27 AND 29 NASSAU STREET, NEW YORK.

"Standard" Brake Shoe & Head.
Light, Strong, Simple, Durable.

The Best and CHEAPEST IN USE.

Both Head and Shoe quickly adjustible, the latter also easily reversible when required. All the corresponding parts of each thoroughly interchangeable.

Write for circular and Prices.
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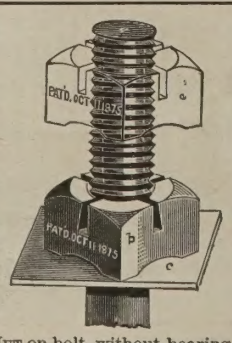

J. W. LARABEE,
Treasurer.

a, ATWOOD NUT on bolt without bearing on base—slots open.
b, ATWOOD NUT turned to bearing *c*, partially closing the slots and grasping the bolt.

MORSE TWIST DRILL AND MACHINE COMPANY

MANUFACTURES
Patent Twist Drills, Machine Bits for Wood, Bit Stock Drills, Reamers, Standard Gauges, Milling Cutter and Special Tools, for use in Railroad, Car and Locomotive Shops. **NEW BEDFORD, Mass.**

NATIONAL EXPOSITION OF RAILWAY APPLIANCES,
TO BE HELD IN
CHICAGO, from **THURSDAY,** the 24th day of May, to **SATURDAY,** the 23d day of June, 1883, in the **INTER-STATE EXPOSITION BUILDINGS,** the largest and best adapted for the purpose in the United States.

GOLD, SILVER AND BRONZE MEDALS
FOR SUPERIOR MERIT.

An abundance of STEAM POWER for running Machinery, and tracks for Locomotives and Cars.

Scientific and Practical Tests by the ablest Scientists and carefully selected Committees.

The Financial Stability of the Exposition assured by a GUARANTEE FUND of
FIFTY THOUSAND DOLLARS.

The proceeds, after payment of Expenses, to be devoted to **BENEVOLENT PURPOSES** connected with the RAILWAY SERVICE.

All material and articles properly coming under the head of RAILWAY APPLIANCES or SUPPLIES, admitted.

FOR FULL INFORMATION address the SECRETARY, care GRAND PACIFIC HOTEL, CHICAGO.

E. H. TALBOTT, *Secretary.* LUCIUS FAIRCHILD, *President.*

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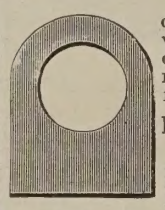
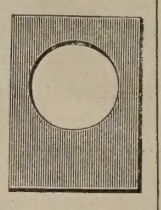
GELATINIZED FIBRE FLEXIBLE DUST-GUARDS.
Superior to Leather or "Vulcanized Fibre."
Keep the Oil in the Car-Boxes and Sand and Dust out of Them.



They are not affected by oil, grease or petroleum; do not cut the axles, as grit does not adhere to them; keep their shape well and will outwear several leather ones. Cut to order of any desired thickness or pattern. Send drawing or sample for estimate. This material is **absolutely free from grit, and will not become brittle and break.**

NOW IN USE ON MANY LEADING RAILROADS, GIVING GENERAL SATISFACTION.

Master Car-Builders desiring to cut their own washers can be furnished with FLEXIBLE SHEET GOODS of any desired thickness; being uniform in quality and thickness, can be cut without waste.



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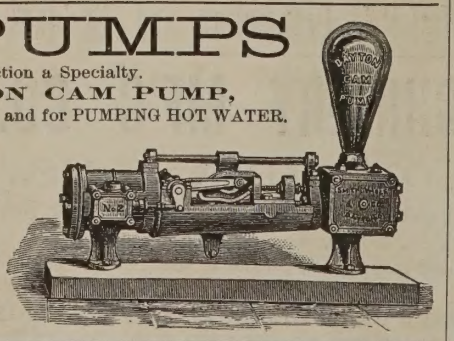
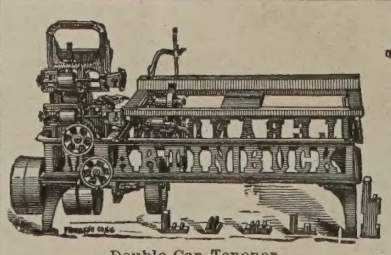
STEAM PUMPS
For Boiler Feeding and Fire Protection a Specialty.
THE IMPROVED DAYTON CAM PUMP,
Designed and built especially for BOILER FEEDING and for PUMPING HOT WATER.

Steam Pumps and Hydraulic Machinery
For Railroad Purposes.
The Combined Pump and Boiler, with Removable Water Cylinder.

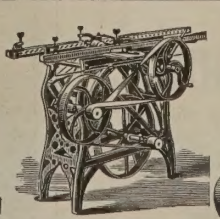
The MOST POWERFUL FIRE PUMPS ever made. Every machine warranted. Over **1,800** in use. Send for Descriptive Circulars.



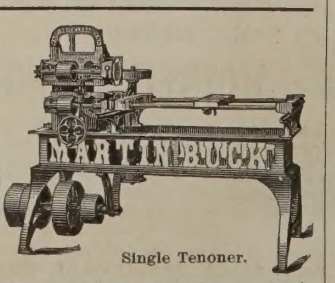
SMITH, VAILE & CO., Dayton, O.
CHICAGO HOUSE, 24 WEST LAKE STREET.



Double Car Tenoner.

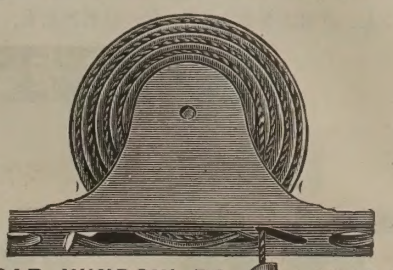


Blind Mortiser.



Single Tenoner.

Single, Double and Triple Tenons and Gaining done on the same machine; especially adapted to car work. Single Tenoners all iron, with carriage mounted on trucks; Blind Mortiser and Borer combined for fixed and rolling slats; Adjustable Groover Heads, and a full line of Wood-working Machinery.
MARTIN BUCK, Lebanon, N. H.



CAR WINDOW BALANCE."
For Passenger Coaches, Sleeping and Parlor Car Windows, consisting of Cone and Coil Spring with wire cord, balancing the weight of sash; noiseless in operation and placed entirely out of sight. Adopted by many of the leading roads. No car complete without them.

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FOREIGN AND DOMESTIC
CABINET WOODS
SUITABLE FOR CAR WORK.
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Portable Forges,
All sizes, for the lightest to the heaviest work, run by Chain Gear and Flat Belts. Strong, plast and durable. For sale by

Keystone Portable Forge Co.
204 North Fourth St.,
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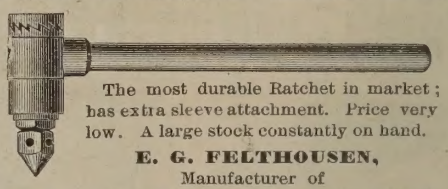
Patent Combination Ratchet Drill.



The most durable Ratchet in market; has extra sleeve attachment. Price very low. A large stock constantly on hand.

E. G. FELTHOUSEN,
Manufacturer of
HAND & AUTOMATIC CYLINDER OIL PUMPS, Ball and Wheel Gauge Cocks, Flue Cleaners, etc.
Salesrooms, 59 and 61 Main Street;
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RAILROAD CROSS TIES
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Ties, spring delivery, Lake Erie and Ontario Ports.
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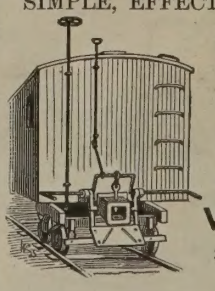
HAULENBEEK'S
PATENT CAR COUPLER.
SIMPLE, EFFECTIVE AND CHEAP.



Requires no change of Draw Heads or Links and Pins, except that pin being attached to coupler prevents its being lost or stolen.

No loss of life or limb can possibly occur when used.

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PURE WHITE LEAD.
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Important to Railroad Managers and Master Mechanics.

SIBLEY'S PERFECTION VALVE OIL.

More perfect lubrication insured, and entire freedom guaranteed from corrosion of cylinders and destruction of steam joints by fatty acids.

In exclusive use on 50 railroads.

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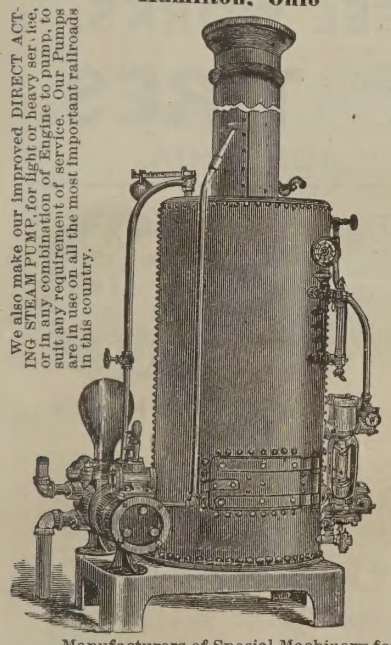

We also make our improved DIRECT ACTING STEAM PUMP, for light or heavy service, or in any combination of Engine to pump, to suit any requirement of service. Our Pumps are in use on all the most important railroads in this country.

Send for New 17th Annual Illustrated Catalogue and Price List.

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RAILROAD TIES, CAR AND RAILROAD LUMBER
WHITE AND YELLOW PINE AND OAK,
No. 120 Liberty St., N. Y.
Also North Carolina Pine Boards. Plank and Dimension Lumber to Order.
GENERAL RAILROAD SUPPLIES.

Eclipse System of Water Supply for Railroads.

ECLIPSE SOLID WHEEL WIND MILLS.

Tested 14 years. Perfectly self-regulating. Conceded by the leading railway companies of this and other countries to be by far the strongest, safest and most powerful wind mill made.

Frost Proof Tanks

100 to 100,000 Gallons capacity, with all modern appliances.

Outlet Valves Spouts and Fixtures.

Improved Double-Acting Pumps.

We have furnished over **500** wind mills and **250** omplete water stations in 1881 to the leading railoads in the United States and Canadas. Two million feet of tank lumber constantly on hand. Our capacity is such that we can execute large orders promptly. Complete stations erected on trial when desired to test the correctness of our claims. Send catalogue and price-list.

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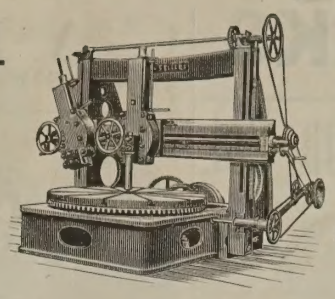
WILLIAM SELLERS & CO., PHILADELPHIA,

Iron and Steel Working Machine Tools, for Railways, Machine Shops, Rolling Mills, etc.



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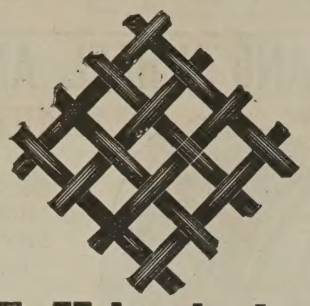
Pivot Bridges,
SHAFTING.

BRANCH OFFICE, 79 LIBERTY STREET, NEW YORK.



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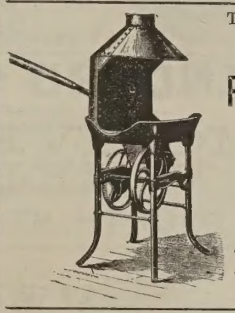
FOR
CAR DUSTER AND LOCOMOTIVE SPARK
WIRE CLOTHS.
SPECIALTIES.
E. Holenshade, 136 Lake St., Chicago, Ill.



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PORTABLE FORGES
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Made by any Manufacturer in the World.
Send for Catalogue and Prices to
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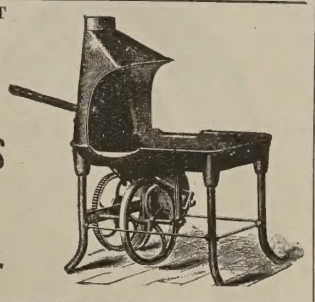

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Car Sills, Bridge Timber and other Special Bills

Also Dealers in Car Flooring, Roofing and Siding.

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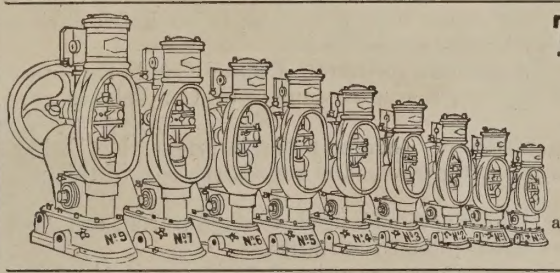

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MADE BY

VALLEY MACHINE CO

Easthampton, Mass.,

are the Best in the World for Boiler Feeding and other purposes.

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WHOLESALE DEALERS IN

RAILWAY SUPPLIES, PIG IRON, BLOOM AND ORE, OLD RAILS,
Car Wheel Axles, &c. Scrap Iron, Steel, Borings, Turnings,
Metals of all kinds.

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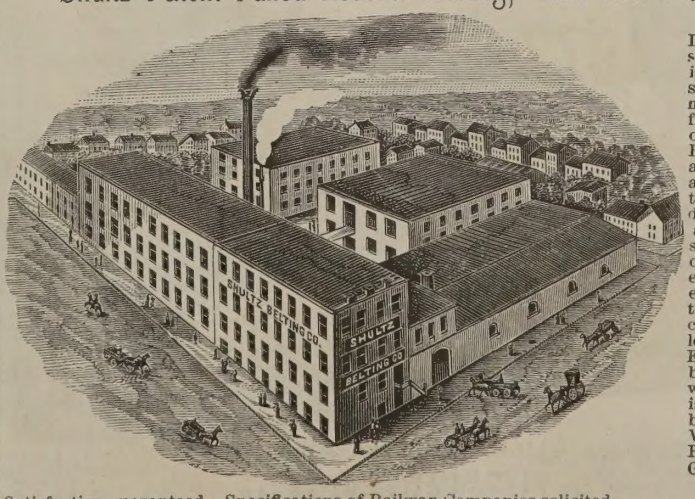
SHULTZ BELTING CO.,

Cor. Easton and Barton Sts., St. Louis, Mo.

MANUFACTURERS OF

Shultz Patent Fulled Leather Belting, Lace and Picker Leather.



OUR Belting is made of Leather tanned on the surfaces only; the interior (which is the fibre and strength of the hide) is not tanned, but Rawhide fulled and softened by our patent process. Our Belting is more pliable, and hugs the pulley better and transmits more power than any other belt. It does not pull out at the ace holes or rivets. It stretches less than any other belt. It works equally well for the largest Driving Belts or for the fastest running machinery and smallest pulleys. Our LACE LEATHER is made of Rawhide, by our patent process, without any tanning, and is stronger, and will wear better than any other. We also make the best Picker Leather and Belt Grease in the country.

Satisfaction guaranteed. Specifications of Railway Companies solicited.

Boston House, 20 Milk St., FRANK PIERCE, Manager.
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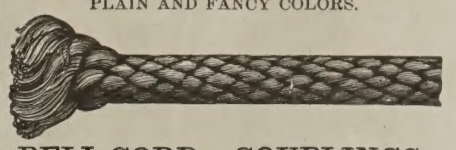
Philadelphia House, 140 N. Third St., JAMES GARNETT, Manager.
Curtis & Co. Mfg. Co., 40 Franklin St., Chicago, Ill.
Agents in all Cities.

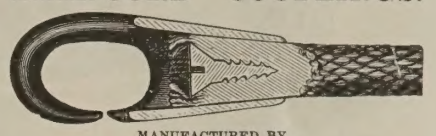
STEEL CASTINGS.

RAIL-ROAD AND MACHINE CASTINGS
OF ALL KINDS FROM ½ LB TO 10 TON.
LOCOMOTIVE CROSS HEADS AND GEARING A SPECIALTY.
EUREKA CAST STEEL CO.
No 307 WALNUT ST. PHILAD.
WESTERN OFFICE 45 LA SALLE ST. CHICAGO, ILL.

SOLID BRAIDED BELL CORD
PLAIN AND FANCY COLORS.



BELL-CORD COUPLINGS.



MANUFACTURED BY
SILVER LAKE CO.
HENRY W. WELLINGTON, Agent, BOSTON.

STEEL RAIL BENDER

Steel Rail Benders, Track Drills, Track Jacks, Track Wrenches, Car Movers,
RAIL ROAD SUPPLIES.
E. P. DWIGHT,
407 Library St., - - Philadelphia, Pa.

CRANE BROS. MANUFACTURING CO.,

CHICAGO,

MANUFACTURERS OF

STANDARD WEIGHT { LAP-WELD { WROUGHT-IRON

PIPE,

Brass and Iron Goods
For Steam and Gas-Fitters and Engine Builders
Cast Iron and Malleable Iron Fitting
STEAM PUMPS,
Hollow Stay-Bolt Iron, Babbitt Metal, &

RAILWAY SUPPLIES.

H. L. LEACH,
NEW ENGLAND AGENT
FOR
Nathan & Dreyfus—Oilers and Lubricators an Freidmann's Injectors and Ejectors; C. W. Pickering & Co.—Locomotive and Car Springs.

Boiler Tubes, Plate Iron and Steel Boilers, Tanks Machinists' Tools, Locomotive Frames, Crank-Pins Axles, Head Lights, Steam Gauges, Car Wheels Etc., Etc.

77 WATER STREET, BOSTON, MASS

THE STANDARD LUBRICATING OIL

OF AMERICA

FOR RAILROADS.

GALENA

ENGINE, COACH AND CAR OIL.

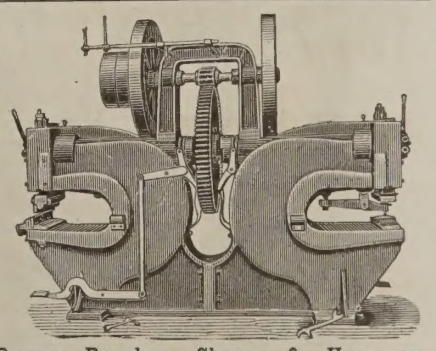
Gravity, 26°, 27°, 28°, 29°. Cold Test, 10° to 15° below zero.

No freezing in coldest weather, and entire freedom from hot journals at any time, as its exclusive use upon a majority of the leading railroads has demonstrated.

Showing Better Results than any Oil Extant.

REFERENCES FURNISHED ON APPLICATION.

GALENA OIL WORKS (Limited),
FRANKLIN, PA



Power Punches, Shears & Hammers.

We make over 100 sizes of Punches and Shears, Double and Single, varying from 500 to 36,000 pounds in weight, and adapted forevery variety of work. The Double machines are equal to two Single ones, as each side is worked independently. Also

ADJUSTABLE HELVE CUSHIONED HAMMERS

Of all sizes, Unequaled for Efficiency and Durability

THE LONG & ALLSTATTER CO.,
Hamilton O.

Index to Advertisements in the National Car-Builder.

THE NATIONAL CAR-BUILDER.

DEVOTED TO THE INTERESTS OF RAILWAY ROLLING STOCK.

VOLUME XIV. NUMBER 5. | MAY, 1883. | SINGLE NUMBERS, TEN CENTS, $1.00 PER ANNUM.

Miscellaneous Items.

THE 24th of May is named as the day upon which the great East River Bridge will be formally opened for traffic.

MR. FREDERICK W. EAMES, the inventor of the Eames Vacuum Brake, was killed in an affray at Watertown, N.Y., on the 20th ult.

THE three locomotive shops at Paterson, N. J., last month shipped 52 locomotives to various roads. The shops are all running on orders.

THE John Stephenson Co. is shipping 60 street-cars to a street railway company in London, and is also filling orders from Mexico and Australia.

THE Vandalia company, as fast as they can, are replacing the iron wheels with a 43-inch paper wheel on coaches run with through express trains.

MR. J. C. PAUL has been appointed General Superintendent of the Woodruff Sleeping & Parlor Car Co., with office at 115 Broadway, New York.

C. C. MASON'S "Pennsylvania Improved Car Seat" has now been in use about four years, and has given general satisfaction wherever tried. Upwards of thirty roads are now using it.

THE Chicago, St. Louis & Pittsburg road has decided to order 35 new locomotives, 35 passenger coaches, and 1,900 box cars. About $150,000 is to be expended in buildings and shops at Indianapolis.

A PASSENGERC AR that was built in 1840 has been sent to the Harlan & Hollingsworth Company, at Wilmington, Del., to be done up preparatory to being placed in the Chicago Railway Exposition.

AN exchange says: "A trial of rails made of paper pulp under a high pressure, will soon be made on a western railway. If the rails prove good, there will be a revolution in railroading." The "if" is well put in.

THE Central Railroad of Georgia has begun the building of a number of large locomotives of the most modern type for both passenger and freight service. They will be built at the road shops at Savannah and Macon.

THERE are about 10,000 plants now growing in the Erie company's hothouse in Port Jervis, which will, when the season opens, be distributed along the Delaware division for the adornment of the grounds about the stations.

THE Youngstown (O.) Car Works, though not running full, are employing 130 men in the several departments. Last week they received a large order for cars, and as soon as the material is received will have 200 men at work.

THE "Challenge Coach Grease," manufactured by W. S. Calhoun & Co., Chicago, Ill., was put to a trial test recently on the Pennsylvania R. R. Limited Express, the cars to which it was applied running 4,000 miles without renewing the grease or touching the boxes.

OPERATIONS have commenced by which, at a cost of $1,250,000, New Street station, Birmingham, England, will be converted into the largest railway depot in the world. It will cover a total area of 45,000 square yards, or over eleven acres, and will have three platforms, each 1,000 feet long.

THE Jackson & Sharp Co., of Wilmington, Del., have recently completed a private car for Col. J. Condit Smith, General Manager of the new Chicago & Atlantic Railway. In design and finish it is thoroughly palatial throughout. The trucks have Paige's wrought metal wheels.

THE first engine ever run on the Baltimore & Ohio Railroad will be exhibited at the Chicago Exposition. It is a crab engine with walking beam, and will be in charge of Engineer Galloway, who first handled her throttle. On its western trip, it will be put on exhibition a few days at Cincinnati.

THE discharge of a jet of steam from the cylinder cocks directly upon the rails is said to be more effective than sand in preventing the slipping of locomotive wheels while ascending grades. Washing the rails with water for this purpose is no new idea, and the use of steam is practically about the same thing.

CAPT. C. W. ROGERS, the general manager of the St. Louis & San Francisco Railroad, attributes the comparatively low percentage of its operating expenses to the use of the American Brake Co.'s automatic brake, which checks the movement of trains so instantaneously that wrecks and collisions are of rare occurrance.

THE Lehigh Car Wheel and Axle Works (McKee & Fuller), Catasauqua, Pa., have shipped 400 gondola and 200 box cars to the Buffalo, New York & Philadelphia road, and have just completed 100 34-foot 20-ton gondola coal cars for a Southern road. They are also building a sample stock car for the New South Wales Railway in New South Wales.

THE Hopkins' Lead-Lined Journal Bearings are to be used on 3,000 cars recently contracted for by the Northern Pacific Railway; and they are also specified for 2,000 cars for the New York, Chicago & St. Louis; 500 for the New York, Pennsylvania & Ohio; and 500 for the Cleveland-Lorain & Wheeling. The last named are box-cars, and, will be built by the Erie Car Works.

A RAILROAD SWITCH has been invented by John T. Rigney, Baltimore, Md. The rail of one side of the main track is broken, the opposite rail of the main track remaining unbroken. The switch is placed on the broken-rail side. The operation of the different parts (switch rail, elevated rail and guard rail) is such as to prevent, under any circumstances, the derailment of a train by a misplaced switch.

MR. JOSEPH HILL, Superintendent of the Vandalia Line, says that since the order requiring trainmen to use the coupling stick in coupling cars was issued two years ago, not one man who has obeyed the order has been injured while making couplings. The order states that men disobeying are made liable to dismissal from employ, and if hurt while coupling by hand they need expect no help from the company.

A LOCOMOTIVE, called the "Robert L. Walker," built by the Taunton Locomotive Works, and combining some novel features, has been tried on the Boston & Maine road. It has a double fire-box, so arranged that one is kept at full draft while the other is being supplied with coal, and is also said to be a perfect smoke and spark consumer. The engine is to be tested on the Eastern and some other roads.

CONDUCTOR JUDKINS, on the night train from Bangor, on the Maine Central Railroad, has devised a system of electric communication from each car to the engineer, which is intended to displace the familiar bell-cord. The system is the same as is used in hotels, excepting the method of connecting the wires between the cars, and for this Mr. Judkins will endeaver to secure a patent. The system has been successfully employed upon Mr. Judkins' train for some weeks.

THE Prince of Wales' new railway carriage is a marvel of æsthetic decoration. It is 50 feet long and contains saloon, study, two bed-rooms, two dressing-rooms and a bath-room. The Prince's bed-room is hung with old gold silk and the furniture is upholstered to match. Mirrors are let into the door panels and the whole suite can be lighted either by candles or by electricity. The carriage has been built by the Southeastern Railway Company, and the Prince pays for its use.

THE Wason Manufacturing Company, at Brightwood (Springfield), Mass., recently finished 14 first-class passenger cars for the Boston & Providence road, and has orders for passenger cars for the Southeastern of Canada, Passumpsic, Portland & Ogdensburg, Maine Central, St. John & Maine, Cheshire, Lehigh Valley, Denver & New Orleans, Bennington & Rutland, and Old Colony roads. The freight department is at work on an order for 100 cars for the Panama road, 25 for the Connecticut River and a number of Burton stock cars.

DURING the first six months of the current fiscal year which ended March 31 the Manhattan Railway Company carried over its thirty-two miles of elevated road 46,131,057 paying passengers. This gives a monthly average of 7,688,509½, or, divided by days, exclusive of Sundays, when only two of the lines are open, and when the travel on these is very light, 293,637. There is no system of railways in the country, no matter how many thousand miles of line it embraces, which in the same period carried one-fourth as many passengers.—*Elevated Ry. Journal.*

A TRAIN of parlor cars, built expressly for the Bound Brook route, has just been turned out of the shops at Reading, Pa. Each cost $10,000 in round figures. They are divided into several apartments, and the finest plush has been used in upholstering, all of which has been done in a skillful manner by the upholsterers in the employ of the company. Each car is supplied with smoking and wash-rooms fitted up with an eye single to convenience and comfort. Solid silver receptables adorn the car on each side, and the heating facilities are of the best.—*Elevated Ry. Journal.*

IT is announced that the Chicago & Atlantic Railway will be open for traffic early in the present month (May). This road, in connection with the New York, Pennsylvania & Ohio and the New York, Lake Erie & Western, will form a through trunk line between New York and Chicago. The track is laid with the best steel rails, and there are 3,000 oak ties to the mile. Pullman car trains will be run between the two terminal cities, via the Erie road, without change. The sleeping, drawing room and thoroughfare coaches will be models of elegance, and will be lighted with the Pintsch gas.

DID you ever see a general passenger agent making a map? No? Well, he takes a ruler and draws a straight line from one point to another. That line represents his railroad. He then moves a couple of States and a dozen towns out of the way so as to make room for his road. Sometimes he gets Arkansas away down in Florida, but he can't help it. After he has got the States fixed and the towns located, he draws a regular spiral coil all over the map. If it is not crooked enough to suit him he rubs it out and draws another. This is the opposition railroad—*N. O. Times-Democrat.*

GERMANY now has 22 locomotive works, four of which manufacture engines for narrow-gauge roads. The annual production of the 18 others is about 1,730 engines. Prussia alone turns out 1,060 locomotives. Berlin has three shops making 450, Hanover has one establishment which furnishes 200 and Hesse-Nassau one which manufactures 150 annually. The annual production for narrow-gauge roads is 70. The total number so far made is 20,700, of which Borsig, of Berlin, contributed 3,000. Austro-Hungary has five establishments, and the annual production is 400 engines. Switzerland can make 350.

THE Buffalo Car Manufacturing Co., is building twelve boarding cars for the West Shore road. These cars will constitute a train, and be fitted up with all the conveniences of a boarding-house. One car will be arranged as a sleeper with accommodations for 24 men. The dining car will be properly equipped and provided with a commodious kitchen at one end. The third is what is called the waiting car, in which the men may sit, smoke and chat. In one end of this will be a bunk room for the use of the train-men. The cars are all 50 feet long and 9 feet wide, and will no doubt prove a paying investment.

THE Indianapolis Rolling Mill Company is making some very interesting experiments in a new process for the manufacture of a combined steel and iron rail, the head of the rail to be steel, the body iron. It is claimed that a rail of that character will be just as durable as an all-steel rail, and much less liable to break. President Jones states that he is quite confident that the experiments are to be a grand success. The material which goes into the rail is prepared through a puddling process. When the rail is finished, although it will be in every respect superior to an all-steel rail, it will cost considerably less —*Indianapolis Journal.*

AN "Association of Railway Superintendents of the Northwest" has been formed, with its headquarters at St. Paul, Minn. The object of the association is to afford an opportunity for the interchange of views, and for mutual benfit and social intercourse. The regular meetings are held on the first Friday of each month. The present list of members includes general superintendents, superintendents and assistant superintendents of a number of Northwestern roads, including the Northern Pacific. The officers of the association are, S. R. Stimson, President; C. F. Hatch, 1st Vice-President; Geo. W. Cross, 2d Vice-President; and T. E. Clark, Secretary and Treasurer.

FIR, pine, oak and cedar of unsurpassed quality, and practically unlimited in quantity, clothe the mountains, overhang the rivers, and shadow the plains of the Puget

Sound district in Washington Territory. On a moderate estimate, it is calculated that this region will yield the almost unimaginable quantity of 160,000,000,000 feet of valuable timber. The trees attain a remarkable development both in height and beauty. The yellow fir is frequently found growing to a height of 250 feet, the white cedar to 100 feet, with a girth of over 60 feet; the white oak is 70 feet in height, while ordinary sized specimens of the sugar pine yield from 6,000 to 8,000 feet of cut lumber.

THE Reading *Eagle* says: The officials of the Reading road have been experimenting with mirrors at Robesonia station with a view of perfecting an arrangement by which the telegraph operator can see, by consulting a glass on the table, the switches and other signals without going outside of the office. Some trouble was experienced by the men in adjusting the glasses, but the difficulty, it is said, has been overcome. These experiments are important, and it is quite probable that in a very short time the system will be put in operation at all important stations, especially where the operators or agents are held responsible for switches and signals located near their offices.

A DRAWBRIDGE SAFETY SWITCH has been adopted by the New Haven & Hartford Railroad Company, which, mechanically speaking, secures trains on that road from running into an open draw. The mechanism for working the draw is so arranged that it is impossible to move the levers doing this work except in a certain order, and in this order they successfully set two long-distance danger signals before the bolt can be drawn and the draw opened. On the other hand, it is impossible to change the danger signals until the draw has been closed and bolted. A switch is also provided which acts automatically, and when the draw is open switches off a train that, disregarding the signals, approaches the bridge.

THE Union Passenger Railway Co., of Philadelphia, opened its new cable road April 5. Nine cars were propelled at a speed of seven miles per hour. The cab is different from those used in San Francisco or Chicago. The engineer is inclosed in a glass partition, which shuts him off from all communication with the passengers and enables him to devote his whole attention to his business. The running of the cars is attended with little noise, the curves are easily turned and the stops and starts satisfactorily made. The construction of the cable line was begun in May, 1882. There are 2,500,000 pounds of iron buried in the street. The two engines supplying the power for moving the cables have a capacity of 100 horse-power each. The driving gear is a duplicate of that employed in Chicago. The rope is an endless piece, 9,200 feet long, and is composed of crucible steel. Ten cars, with the brake attachment, have been built for the line. The cables without the cars require about 15 horse-power to run them, and one set are supposed to last a year.

THE new buffet parlor cars, "The Countess" and "The Duchess" are now run between St. Louis and Kansas City over the Missouri Pacific Railway. These coaches are thus described: The cars are sixty-five feet long, and have a width of 9 feet 8 inches. The exterior is ornamented in latest Pullman standard style. Trucks have all modern appliances—33-inch paper wheels, and the riding qualities are the best. The interior is finished in white oak of beautiful design. Large plate-glass windows extend the entire length of the car. Each car has twenty-seven large comfortable chairs of the very latest pattern, and are upholstered in maroon plush. In addition to this, at each end there are two very handsome sofas. At one end there is an elegant smoking room, handsomely finished throughout. Toilet rooms for ladies and gentlemen are located at each end of the car. The buffet is situated at one end of each car and separated from body by plate-glass partition extending almost the entire width, presenting a full view from any portion of the car. Handsome satin curtains drape from each side. The china-ware used is of a very unique pattern, decorated in handsome Japanese style, and is arranged in racks for that purpose directly behind the glass partition. Each car will be in charge of a conductor and provisions will be served by colored attendants. The entire service will be in every respect first-class.—*Railway Register.*

THOSE in charge of the railway exhibition at Chicago ask for some curiosities in that line. Quite a number could be suggested, even if they can't be found; among them the following: A drunken passenger who has his ticket ready; well-dressed lady passenger who refrains from opening a window on a thinly-clad man in the back seat; a window that won't stick up in warm weather or down in cold weather; a brakeman that will help a lady on and off without squeezing her arm; a train that won't go too fast or too slow, or make too many stops for all the passengers it contains, and a baggage master that will handle every trunk as if it were his wife's mother's.—*Pittsburg Telegraph.*

THE sales of the Allen Paper Car-Wheel Co. between Feb, 1 and April 19, 1883, have been 3,936, which is an increase of 1,685 over the number sold during the corresponding period of last year. The Trustees of the East River Bridge have decided to use the company's wheels on all the car equipment of the bridge, this decision having been prompted, doubtless, by the very successful performance of the paper wheels on the elevated roads.

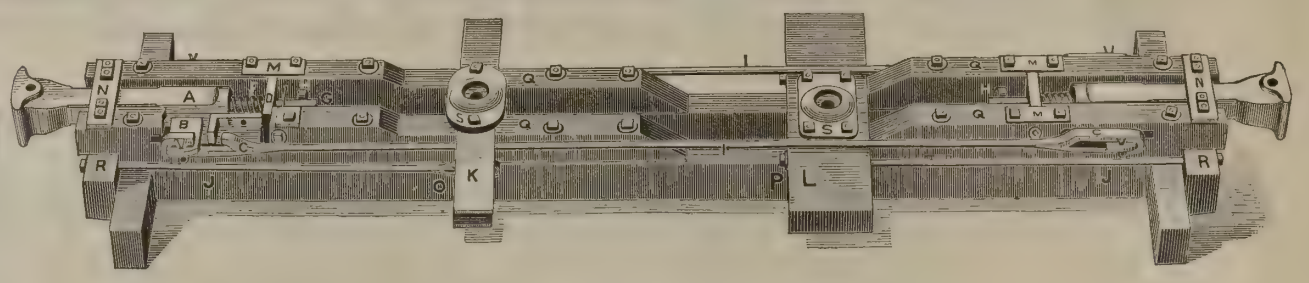


Fig. 1.

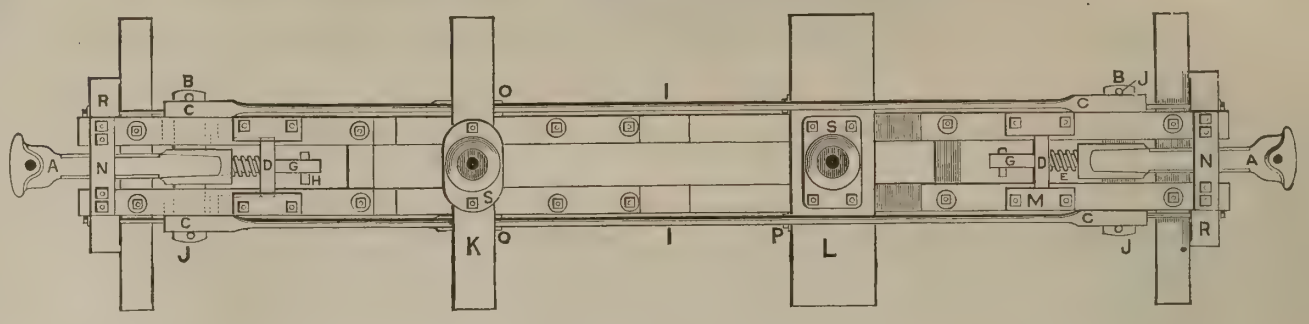


Fig. 2.

CONTINUOUS DRAW-BAR FOR FREIGHT CARS.

The cuts illustrate a continuous draw-bar, which has been for some time in successful operation on the Ohio & Mississippi and other western roads, and of which the American Continuous Draw-Bar Co., of Aurora, Ind., are the proprietors. The points in which it differs from other devices of the kind, and in which its merits as an improvement consist, will be readily understood from the engravings.

Fig. 1 is an inverted perspective view of the lower parts of a freight car body, and Fig. 2 an inverted longitudinal section. The body-bolsters *K* and *L* represent iron and wooden bolsters respectively, either of which can be used with the continuous draw-bar. The leading features of the arrangement are the draft-rods *I* and the cross-bars or draft-keys *B*, the latter extending through the draft timbers and working in loops at the ends of the rods, the loops being long enough to allow sufficient play to the cross-bars to enable the latter to receive the heaviest bumping without buckling the rods, or subjecting them to any buckling strain at all. The cross-bars or draft-keys are of wrought iron 1 in. thick and 5 in. wide, and the rods are 1¼ in. in diameter. The spring *F*, between the end of draw-bars and follower-plate, is protected by angle-irons, which are let into the draft timbers and have an end bearing on the follower-plate, as shown in Fig. 1, so that in heavy collisions the draft-key strikes the angle-irons before the spring is exhausted and prevents it from being broken. The carry-irons *N* are the same as those in common use; *M* is a light iron plate to keep the follower in place, and *J* is a rod extending through the dead-woods and bolsters, as shown. The front opening of the draw-heads may be of any form that may be desired.

Instead of one heavy rod in the center, weakened by punching holes in it for the keys, as in other devices of this class, two light rods are substituted, in which no key-holes are needed. The protection to the springs is a feature which all railroad men who are familiar with freight car repairs and the losses from broken springs, will readily appreciate. In the working of this device the car body is relieved from pulling strains. It is pushed rather than pulled; so that it is impossible to pull out a draw-bar or the end of the car; nor is there with this device any need to use an engine to pull out bent and crooked rods in order to put in new ones; and if a new draw-bar is required it can be put in in the time occupied in chaining up a car, there being no nuts to be taken off nor bolts to be taken out. The simplicity of the parts, and the absence of intricate complication, insures cheapness and safety and durability.

This draw-bar arrangement has been in use about four years. Some 700 cars are now equipped with it on the above-named road. It has also been adopted by ten other western roads, and will be exhibited at the Chicago Exposition of Railway Appliances.

Lubricants and Lubrication.

The following interesting information on these subjects is contained in Professor Thurston's recent work on the "Materials of Engineering:"

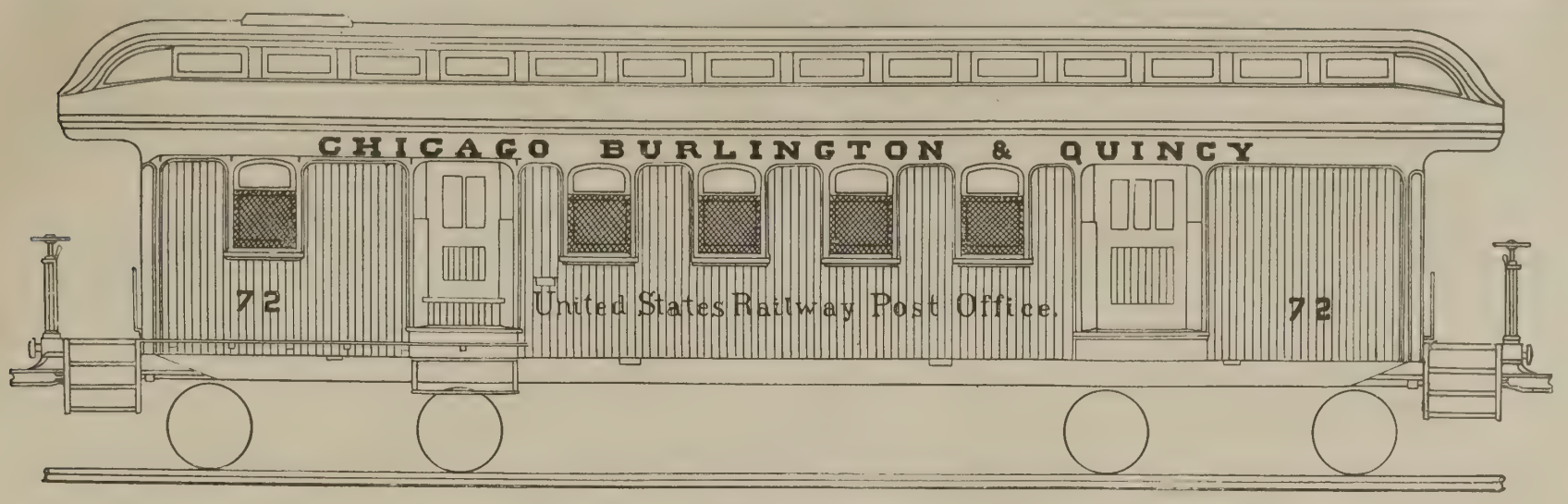
"It is evident that, in order that any substance may be efficient as a lubricating material, it must possess the following characteristics: (1.) Enough 'body' or combined capillarity and viscosity to keep the surfaces between which it is interposed from coming in contact under maximum pressure; (2) the greatest fluidity consistent with the preceding requirements—*i. e.*, the least fluid friction allowable; (3) the lowest possible co-efficient of friction under the conditions of actual use—*i. e.*, the sum of the two components, solid and fluid friction, should be a minimum; (4) a maximum capacity for receiving, transmitting, storing and carrying away heat; (5) freedom from tendency to decompose or to change in composition, by gumming or otherwise, on exposure to the air or while in use; (6) entire absence of acid or other properties liable to produce injury of materials or metals with which they may be brought in contact; (7) a high temperature of vaporization and of decomposition, and a low temperature of solidification; (8) special adaptation to the conditions as to speed and pressure of rubbing surfaces under which the unguent is to be used; (9) it must be free from grit and from all foreign matter. The value of a lubricant to the consumer, as is seen from what has just been stated, depends on its cost in the market, its efficiency in reducing friction, its durability under wear, its freedom from liability to 'gum,' its freedom from acid and from grit, and its permanence of composition and of physical condition when subjected to changes of temperature, and also, frequently, its capacity for carrying away heat from journals already heated. Thus, sperm oil is known by all experienced mechanics and by all dealers in oil to be one of the very best of known lubricants, but its high price precludes its use except for special purposes. Some other oils are cheap, but have little lubricating power; still others are good reducers of friction, but do not wear well, or frequently cannot be retained on the journals; others, as linseed and the drying oils generally, although sometimes excellent otherwise, gum so seriously that they can not be used for lubrication, while a good deal of the tallow in the market, and some other lubricants, contain acids of decomposition or acids which have been used in their clarifications which have not been so completely removed as to prevent injury by their action on the metals. Some lubricants can not be used at a low temperature, because they are liable to congeal, and others can not be used in steam cylinders or where high temperature is liable to be met with, because they decompose or vaporize under such circumstances.

"Every dealer in oils and every consumer of lubricants who desires to know with certainty whether he has in any case precisely that lubricant and that quality which is nominally given him, must resort to some method of identification of the material. Every user of such a material who desires to know whether it is well adapted to a specific purpose, or who wishes to find out what are its peculiar characteristics, must find some method of testing it, and of thus ascertaining whether under the conditions arising in his practice it will serve his purpose. He must know whether it will bear the pressure and will run without heating his journal at the speed to which he must subject it. Many different conditions must therefore be studied, and the behavior of the lubricant determined with reference to each, before it can be known with any degree of certainty what is its real value for any specified purpose, and it is equally evident that the conditions under which the behavior of an oil or other lubricating material is to be determined should always be those approximating with the greatest possible exactness to the conditions proposed in its actual use."

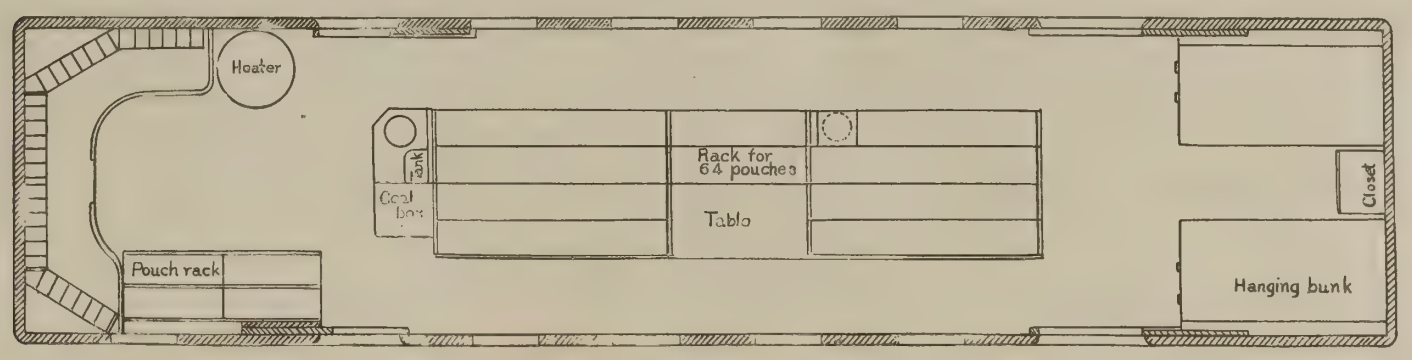
THE TANITE CO., of Stroudsburg, Pa., will exhibit at the Chicago exposition a new machine for grinding car journal brasses, which supersedes the use of the lathe for that purpose. The capacity of the machine is 600 brasses per day, and the grinding is perfectly true. The company also manufacture a machine for grinding locomotive slide bearings. About thirty of them are in use and give good satisfaction.

THIRTEEN years ago the Pennsylvania Railroad Company determined to test the relative merits of English-made and Pennsylvania-made steel rails. They selected from among the English rails what is known as the Barrow rail, and placed by the side of it rails from the works of the Pennsylvania Steel Company. Several days ago these rails were examined, when, it is said, it was found that those made by the Pennsylvania Steel Company were superior to the others.

WHEN a sleeping-car porter learns that one of the passengers is a "spotter" or detective for the company, he marks that spotter by cutting three crosses on the bottom of the heel of one of his boots. The porter who next shines the spotter's boots sees the marks, informs the conductor and they two are honest as the day is long while the detective remains aboard. It has been suggested that a spo t ter be put on each car, but this naturally gives rise to the question, "who would watch the spotter?"



Side Elevation.



Plan.

UNITED STATES POSTAL CAR.

Built by the Chicago, Burlington & Quincy Railroad Co.

DIMENSIONS.			
Length of body over sills	40 ft.	10	in.
Width of body over sills	9 "	8	"
Length of car inside	40 "	1½	"
Width between posts of clear-story	4 "	10	"
Height from top of sill to top of plate	6 "	9	"
Height from bottom of sill to top of clear-story	10 "	8	"
Length over all	47 "	10	"
Width over crown molding	10 "	2	"
Height from top of rail to top of car	14 "	3	"
Width of clear-story out to out	5 "	8½	"
Width inside between ceiling	8 "	11½	"
Width of door openings	3 "	0	"
Width of window openings	2 "	0	"
Distance between windows	2 "	2	"
Center of body-bolsters to end of sills	6 "	1	"
Hanging bunk	6 × 3 ft.		
Closet	1 ft. 6 in. ×	1 ft. 10	in.
Coal box	1 " 7½ " ×	1 " 7	"
Tank and water-cooler stand	2 " 2½ " ×	1 " 7¼	"
Table	2 × 4 ft.		
Length of central pouch-rack and letter boxes	18 ft.	0	in.
Width " " " "	4 "	4	"
Width of side passages	2 "	3¾	"
End pouch rack	6 "	2	"
Center to center of truck axles	8 "	0	"
Total wheel base	36 "	8	"

Meeting of Car-Builders at Buffalo.

CAST-IRON CAR WHEELS.

An adjourned meeting of Car-Builders was held at Buffalo, April 11, at which the weight and causes of failure of iron car wheels were the subjects for discussion.

Mr. Wilder submitted a statement of the breakage of car wheels on the New York, Lake Erie & Western road during 30 days.

Mr. Kirby inquired whether the cracked hubs were not due to over-pressure.

Mr. Wilder thought not.

Mr. Blackall asked whether a wheel should be removed with three cracked ribs.

Mr. Wilder replied that a wheel ought to be removed for any crack, and also stated that very few broken wheels caused accidents.

Mr. Kirby inquired whether cracked ribs and plates and hubs indicated a defect in the construction of the wheels, or was it because they were too weak?

Mr. Wilder stated that on his road during the time reported there were 379 cracked plates and 258 broken treads. These are the principal causes of failure.

Mr. Kirby regretted that it was not indicated in these figures which wheels were from defective castings and which from defective tracks.

Mr. Blackall asked whether wheels which had broken had been heated?

Mr. Wilder was not able to answer.

Mr. Garey said that he had not received a report of wheels which had failed on the New York Central Railroad during the 30 days referred to. He formerly believed that broken treads were due to defective track, but now thought they were due to both causes; that is, either to the quality or lack of quantity of metal in the tread. He showed drawings of broken wheels. One broke a segment of the wheels off, the second broke through the hub, and the third broke all the plate off the hub, leaving the latter on the axle.

Mr. Wilder stated that wheels of different makers broke from different causes; that the tracks of our railroads have been constantly improving, and that most of the wheels which were broken on the road, he thought, broke from being too light. The question for the consideration of the meeting was whether the wheels ought to be strengthened, and, if so, where.

Mr. Lentz stated he had a record of broken wheels under their own cars, and he thought that there was a weakness in wheels where the two plates joined, and also under the flange.

Mr. Garey stated that the object in asking the wheel makers to the meeting was to give them the results of practice on railroads and to have them indicate whether it was desirable to increase the weight of wheels. To increase the quantity of poor metal would not cure the evil, he thought. He requested the wheel makers to express their opinions. The drawings of broken wheels showed that they were too light. The plates were from 9-10 to 15-16 in. thick. The record of broken wheels which he had kept showed that many broke where the plates join each other.

Mr. Lentz confirmed the statement of Mr. Gary, and asked the wheel makers what was the cause of breaking at that point.

Mr. Olmstead said that many wheels broke at the core-holes. These holes should be strengthened around their edges. The fractures often commence at these holes and then extend outward.

Mr. Whitney, of Philadelphia, asked whether wheels are heavy enough, and also whether the form is right. Each wheel maker, he thought, must answer the first question himself. The heaviest 33-in. wheels were from 500 to 550 lbs. in weight. The wheels were not increased in weight in proportion to the loads carried. The latter are now nearly or quite double what they were some years ago, and the weight of the wheels has been increased only about 5 per cent. The speed on our railroads is also greater, and this had as much to do with the breaking of wheels, probably, as the weight. The size of the axle has also increased. The size of the hub for the axle is increased. The wheel should be increased in the same proportion elsewhere. He thought that 33-in. wheels should weigh at least 540 to 550 lbs.

Mr. Garey did not think that railroad companies would object to an increase of weight. They would accept wheels weighing 600 lbs.

Mr. Davenport remarked that plates may crack from bad proportions of pattern or want of elasticity of metal; it might also be due to increased loads and high speed. The proper distribution of material in wheels is a matter for the makers to decide. The imperfection at the junction of the two plates may be due to a deposit of scum in casting the wheels or to a displacement of the core at that point. In the process of melting iron it loses its elasticity. He stated that iron after the first melting tested in a Thurston torsion testing machine, twisted 15½ degrees and broke with a strain of 38,750 lbs. per square inch. After being melted the second time it twisted only nine degrees before it broke, and after the third melting only six degrees. The objection to using old wheels in making new ones was that it is impossible to know how often the iron in the old wheels has been remelted. The loss of elasticity in remelting wheels may account for the breaking of plates. He recommended that wheels should be made entirely of new iron, and that old wheels should be converted into bar iron and axles. The temptation to reduce the weight of wheels by the reduction of price was too great for the wheel makers to resist. If a wheel weighing 500 lbs. is all right for a 10-ton car, it is much too light for one carrying 20 tons, and if the speed is also doubled, the 500-lb. wheel is very much too light. If railroad companies would report in what part of wheels they failed, wheel manufacturers would be able to improve the construction of wheels.

Mr. Whitney thought that the use of the air brake increased the number of breakages on account of heating the wheels.

Mr. Garey inquired what wheel-makers do to determine whether the core of the wheels is in the right position. He thought some men were going wild about the carrying capacity of cars, and that it would be a good plan for the wheel makers to get together and say that they would not make wheels for less than a certain price and make them of only the best material.

Mr. Kirby stated that his report showed more chipped treads from defective track than from defective wheels. He thought such failures were due to the increase in the number of crossings on their line. They now had 28 grade crossings.

Mr. Garey exhibited pieces broken from two wheels, one of which weighed 560 and the other 600 lbs.

Mr. Snow considered that a wheel of 540 lbs. made of the best charcoal iron was of the right weight for a 20-ton car. If made of some of the iron which is used in the manufacture of wheels they should weigh from 700 to 800 lbs. He knew that there was a great deal of very poor iron used in the manufacture of wheels, and railroad companies are trying to run 20-ton cars on wheels no heavier and made of much poorer material than was used ten years ago.

Mr. Garey exhibited some blue prints showing sections of a 33-in. wheel which would weigh 600 lbs.

Mr. Griffin said that the manufacturers wanted to know what weight of wheel was required by the railroad companies.

Mr. Ortton said that the design of wheels was very defective. He knew that out of a lot of 4,000 wheels the maker had to pay for one in 12, owing to the fracture of the plates at their junction. The makers attributed it to the fact that they had used an old and superannuated pattern. He thought that the fracture of the hubs was nearly always due to over pressure in putting the wheels on the axle. The chipped treads were largely due to sand holes. He did not think there was any objection to using 25 per cent. of old wheels in the manufacture of new ones.

Mr. Griffin wanted the car-builders to say what the weight of wheels should be made for different classes of cars.

Mr. Garey said there would be great objections to carrying two different weights of wheels in stock. He moved that 33-in. cast-iron wheels should not weigh less than 560 lbs. The motion was amended by Mr. McKenzie to 550 lbs.

Mr. Wilder asked whether a heavier wheel was really needed.

Mr. Snow suggested that there ought to be some relation between the strength of the iron and the weight of the wheels.

Mr. McKenzie did not think that car-builders should dictate to wheel-makers how heavy the wheels should be or the quality of the metal. All the car-builder should say is that the wheels should give a certain amount of service.

Mr Whitney said that wheel-makers are limited as to strength and durability. A light wheel might do the service, but might not last. It was also necessary that it should have the proper amount of chill.

Mr. Blackall said that on his road they were getting better service out of wheels weighing 530 lbs. than out of those weighing 560 lbs.

Mr. Lyman thought it might all come back to the question of the quality of the material. Contracting for cars is a skinning process, and every thing is bought at the lowest price, and the builder therefore gets the cheapest wheels. They are badly bored, and the axles are badly turned, and consequently in extra service the wheels crack, owing to bad work.

Mr. Garey inquired whether wheel-makers test the iron they use for tensile strength and durability.

Mr. Ortton inquired how much good iron ought to stand.

Mr. Swartz answered 28,000 lbs.

Mr. Davenport thought that the Thurston machine was the machine for testing wheel-iron. It strained it more in the manner in which it was strained in active service. The elastic limit of good wheel iron was 38,750 lbs.

Mr. Forney being requested to express his views, said that he thought the question should be approached in a different direction, and that a wheel made of good material need not be as heavy as one made of poor material, and that there should be some relation between the weight of the wheel and the quality of the material. He did not think it would be difficult for wheel-makers to make a specification of the qualities which a good wheel iron should have, and thought that if car-builders would prepare such specification and require that the iron used should have the quality specified, then they would be in a better position to determine what the weight of the wheel should be. He did not think it would be difficult to make test pieces either from broken wheels or from special castings made for the purpose.

Mr. Garey said if the wheel-makers would get together and agree upon what qualities of iron should be used to make a good wheel it would be a great thing for railroad companies. The action which was of most importance at this meeting, however, was to fix on the weight of wheels for immediate use.

Mr. Wilder suggested that the wheel-makers should appoint a committee to confer with the master car-builders.

Mr. Whitney did not think that the wheel manufacturers were the right parties to prepare the specifications.

Mr. Miller considered that all the car-builders can do is to specify what service the wheels should perform.

Mr. McWood was of opinion that the form of wheels is more important than any thing else, and that the weight, etc., should be left to the makers.

Mr. Davenport was disposed to leave the weight of wheels with the car-builders.

A vote was taken to get the sense of the meeting with reference to the weight of wheels. Thirty-one of those who voted were in favor of 550 lbs.; one, 551 lbs.; one, 535 lbs., and one 600 lbs. Three were disposed to leave it with the manufacturers.

Mr. Wilder moved that a committee of five be appointed to confer with all the wheel-makers who were present on the subject of wheels, and Messrs. Garey, Wilder, Miller, Blackall and Lentz were appointed such committee.

CONDITION OF FREIGHT CARS.

Mr. Garey said that the question of the condition of cars ought to be considered at this meeting. It was not improving.

Mr. Kirby said that cars were coming on the Western roads from new lines which would not stand the service.

Mr. Garey thought it would be a good plan for car-builders to visit the interchange points. In all cases in which car-builders looked over the cars it saved a great deal of trouble.

Mr. Kirby had recently examined two cars, between which a man had been killed the night before. One had single deadwoods on, and the other had double deadwoods. The draw-bar of the one pushed in the draw-bar of the other and left 8 in. between. The man was found between the two cars, standing erect, and dead.

Mr. Wilder said that the master car-builders have recommended a standard for these parts. The New York, Lake Erie & Western standard, he thought, was the best. The complaints with reference to the double deadwood is due to the great distance between them.

Mr. McIlvaine: If those roads which use double deadwoods would increase the strength of the draw-bars, it would save much of the trouble.

Mr. Ortton said he had been converted to double deadwoods. He thought they were the best.

A considerable discussion was then held with reference to how many brackets may be cracked before a car should be refused. There was great difference of opinion among those present with reference to this point.

Mr. Lentz moved that the master car-builders of the roads interested in the interchange of cars at Buffalo should meet there in May to look over the cars.

Mr. Garey moved also that other parties be invited to meet the car-builders at that time.

The meeting then adjourned.

New England Railroad Club.

The first regular meeting of the Club after its organization was held on Wednesday evening, April 11, at the rooms provided for it in the passenger station of the Boston & Albany R. R., in Boston. There were present about 50 persons, and the membership was increased to 68 in all.

A resolution was adopted cordially thanking the officers of the Boston & Albany R. R. for their kindness in furnishing such convenient and commodious quarters for the meetings of the Club, and also expressing gratification for the recognition by the company of its objects and purposes.

The Executive Committee was increased by the addition of two members, making it to consist of five members instead of three.

The President, Mr. F. D. Adams, then announced the subjects of discussion for the evening, namely: Brakes, Ladders, Steps and Running-Boards of Freight Cars.

Mr. Marden said these were topics upon which every one present should express his views, and that unless the heads of the car departments of the roads took them up and acted upon them, the road managers would certainly do so.

Mr. Adams spoke of an accident that had recently happened on his road, by which a man was seriously injured by the brake wheel giving way. The Car-Builders' Association had voted to place handles on the ends of cars, but a great many of the foreign cars in the track yards were without handles. It did not amount to much to talk about these things at the car-builders' meetings and then go home without doing any thing. He intended to instruct the men under him to see that these things were thoroughly attended to, and had refused to receive cars upon which the brakes were not in good condition. The heavy trains and increased tonnage required increased vigilance, and there was also a law in force in Massachusetts requiring that cars running upon roads within the State should be kept in good condition. The general officers of the roads were becoming uneasy on account of the frequency of accidents to trainmen in the handling of freight cars, and were looking for some action on the part of car-builders to help the roads in arriving at some agreement with respect to the remedial measures to be adopted. Little things were apt to be overlooked as of trifling consequence. New York Central cars were delivered to the Boston & Albany that were not in good running condition. In some instances the steps and ladder-rounds were gone, and the handles would pull out when the men took hold of them to get upon the cars. The owners of the cars say in such cases, "We have run them over our road and you ought to take them." We have to take them or transfer the freight; and if we adopt the latter alternative we are told that the movement of freight is obstructed, making it difficult for those in charge of the car departments to determine what to do.

Mr. Gordon, of the Concord R. R., admitted that he received cars with the brake-heads gone and lumber loaded over the brakes. To unload the cars in order to repair the brakes would cause a heavy expense. Cars also went over his road that were without ladders, and he, for one, thought the roads owning the cars should be held responsible.

Mr. Adams concurred with Mr. Gordon in the remedy suggested. He believed in obeying the law of the commonwealth by refusing to receive defective cars. Leave them to the roads that received them, and let such roads fall back on *their* connections, and so on, until the home road was reached.

Mr. Gordon thought that the attention of freight agents should be directed to the way in which freight was loaded, and instanced flat cars loaded with boards, one tier above another, and running from car to car.

At the suggestion of Mr. Marden, a committee was appointed to prepare a resolution, or set of resolutions, on the subject, to be considered at the next meeting of the Club, and, if adopted, to be submitted to the representatives of the road departments, with a view to further action to bring about some mutual understanding. Messrs. Marden, of the Fitchburg road, Denver, of the N. Y., N. H. & Hartford, and Ford, of the Boston & Albany, were appointed such committee.

Committee Circulars of the Master Car-Builders' Association.

The following circulars of inquiry have been issued by committees appointed to report at the annual meeting of the Association, to be held in Chicago, beginning June 12:

REFRIGERATOR CARS.

To the Members of the Master Car-Builders' Association:

The committee by whom this circular is issued was appointed by the Master Car-Builders' Association "to report what they know or can learn on the subject of refrigerator cars, and whether it is more economical for railroad companies to own and run such cars or whether they should be controlled by other companies and their employés." You are invited to aid in making such a report by answering the following questions and giving such other information as you may have and which would throw any light on the subject;

1. In your judgment what is the best car now in use for refrigerator purposes and what is the present cost of same complete for service?
2. State average number of miles run per day by refrigerator cars on your road or by your refrigerator cars.
3. What is the cost per mile or year for repairs?
4. What is the mileage or cost per mile paid by your company to refrigerator car companies for running same?
5. In your judgment would it be best or more economical for railroad companies to own and run their own refrigerator cars, or should they be controlled by other companies and their employés?
6. Please give any additional information that you may deem important.

Replies should be addressed to THOS. AYLESBURY, Chairman (St. Joseph & Council Bluffs R. R.), St. Joseph, Mo.

SHARP WHEEL FLANGES.

To the Members of the Master Car-Builders' Association:

The undersigned were appointed a committee of the Master Car-Builders' Association, at its meeting, held at Niagara Falls, in October, 1882, to inquire into the question of "Sharp Flanges, their causes, and the best means of prevention."

In presenting this subject at the next meeting of the Association, in June, the committee would like to make its report as complete as it is possible to do, and it has thought best to address this circular of inquiry to members, so as to get an expression from all railroads in any way represented in the Association, asking for any statistics which they can give, from records of the past year or two, as to the number of wheels drawn from service on account of sharp flanges, and the percentage which this number is of the total number of wheels drawn from all causes, in any or all kinds of service of which record is kept, together with the average mileage of such wheels; or so much of the information desired as can be furnished without too much labor. Also to get the opinions of such members as to the main causes of sharp flanges and the best means of prevention.

If you will kindly give this matter such attention as you can, and address a reply, in whole or in part, to the chairman, at Bethlehem, Pa., by April 30, you will confer a favor upon the committee. If such statement involves too much labor in its preparation, the committee would like a reply to that effect, in order that it may not unnecessarily delay further action. The information so received will not be published, but is to be used only for guiding the committee in making their report.

Replies should be addressed to H. STANLEY GOODWIN, Chairman, (Lehigh Valley R. R.), Bethlehem, Pa.

CAUSES OF ACCIDENTS TO TRAIN AND YARD MEN.

To the Members of the Master Car-Builders' Association:

The committee find it impossible to frame any specific questions which are at all likely to elicit the kind of information that is needed in order to make a satisfactory report on the subject that has been submitted to them. That the loss of life and injury to trainmen on our railroads is terribly great, and the suffering resulting therefrom horrible to contemplate, does not require any evidence to prove. Of the preventible causes of such accidents every car-builder must have more or less knowledge. The committee therefore deem it best to ask the members of the Association in a general way to make such suggestions, with reference to the construction of cars, as their observation has led them to believe would diminish the danger to trainmen.

The committee will also suggest to the members of the Association that in many cases where a radical reform of an evil is quite impossible, great improvement may easily be effected. All our car-builders are aware of the great loss of life and limb from coupling cars. It may be that the cure for this evil has been expected too exclusively from the use of automatic couplers. Members of the Association are therefore requested to make suggestions with reference to the improvement of the construction of the ends of cars, either with or without self-couplers, with a view of thus diminishing the danger to trainmen.

The committee are also of the opinion that, by indicating how the construction of cars and parts of cars can be better proportioned and put together, and made more serviceable and substantial, they may be able to do more to prevent accidents than they could in any other way. Members are therefore invited to make such suggestions concerning improvements of the details of cars as their experience may have indicated are required to make them more durable and less liable to failure and accident.

Those who, from the press of business or other causes, are disinclined to take the trouble of making reply to this circular, should bear in mind that, by giving the subject a little reflection and communicating the results of it to the committee, they may be instrumental in saving valuable lives or preventing most painful suffering.

Replies should be addressed to W. F. TURREFF, Chairman (C. C. C. & I. Ry.), Cleveland, Ohio.

CARRYING CAPACITY FOR FREIGHT CARS.

To the Members of the Master Car-Builders' Association:

At the last meeting of the Master Car-Builders' Association, a committee was appointed on "The most economical carrying capacity for freight cars," and "to report what are safe and economical loads for axles of given sizes." This committee solicit answers to the following questions, with a request that you give any other information within your reach which may aid them in making an intelligent report:

1. Is the cost of repairs of freight cars greater since the loads they carry have been increased, and, if it is, are you of opinion that the cost has increased in greater or less proportion than the loads?
2. Do you think it would be economical to construct cars especially designed for carrying more freight than cars usually carry now, and if so, state what you think the capacity of such cars should be?
3. In your opinion, if car axles are made of ordinarily good material, what should be the length and diameter of the journals, and the diameter at the wheel-seat, to carry loads of 5,000 lbs. *per wheel* safely, what should their dimensions be for carrying 7,500 lbs., and what for carrying 10,000 lbs. of load per wheel?
4. Give any facts which may have come under your observation which showed that axles have been either too small or too large for the loads they had to carry.
5. If the Master Car-Builders' Association had occasion to recommend a standard axle at the next meeting, and were free to adopt what seemed to be in every way the best size, would you advise the adoption of dimensions larger or smaller than those of the present M. C. B. standard?
6. In your opinion, would it be economical to make axles larger than are required for safety, or is *safety* the only practical consideration to be taken into account in their design and construction?
7. What has been your experience, during the past severe winter, in regard to broken axles under freight cars? Have you had many broken; if so, were they small or large axles which broke? Have axles failed more frequently than other portions of the truck?

Replies should be addressed to JOHN KIRBY, Chairman (Lake Shore & Mich. So. Ry.), Cleveland, Ohio.

A Hospital for Railway Men Built by the Railway Exposition.

Every day throughout this country railway men are being crushed between cars, mangled under wheels, parboiled by exploding steam, crippled for life in collisions. Every day railway men find themselves sick and helpless, with no friends to care for them and no money to buy medicine and nursing. Every day railway men are compelled to face the hopeless fact that their youth and strength are gone, and that they must henceforth drag out their existence a burden upon the cold charity of the busy world. It is a painful fact that very little practical thought has been given by railway officers to the condition of their faithful employés after accident, sickness or old age have rendered them unfit for service. There are always men enough to be had. The vacancy in the ranks which is caused when an arm is cut off, or a leg mangled, or when disease or age strike down their victims, is immediately closed by fresh recruits, and the army goes marching on, forgetful of the unfortunate comrades who have fallen by the way. What becomes of the sick, disabled and superanuated men? Only the merciful father knows, oftentimes; for in most cases their employers do not trouble themselves to follow the course of their servants when they cease to be useful. This is not due from hard-heartedness, but because the rush of business engrosses the thoughts of railway officers, and no organized method of providing for those in need offers its assistance.

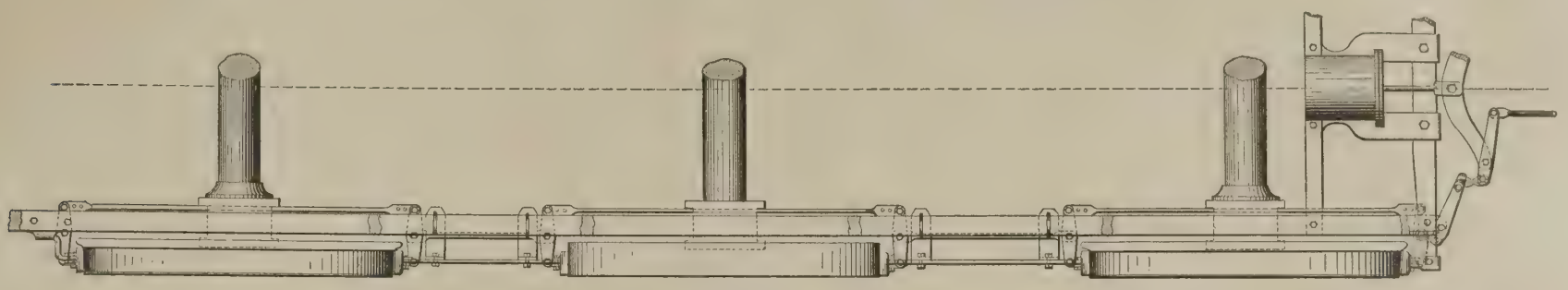
True, some of our great railway companies have of late undertaken the good work of providing a hospital and home for their servants in time of need. The Central Pacific Company has for some years maintained a model hospital at Sacramento for this purpose. It is a noble structure, costing $64,000, and consisting of a main building 60 by 35 feet, four stories and basement, with wide verandas, and with two wings 35 by 52 feet, and a kitchen building near by. It has accommodations for 125 patients, and affords the best of care for employés of the Central and Southern Pacific companies needing its shelter. Somewhat similar provision has been made by a few other companies, and several others—notably the Baltimore & Ohio—have organized employés' mutual benefit associations, which are doing an excellent work for those entitled to their privileges. But the great majority of railway men in the country are still unprovided for, and sudden accident or sickness and certain disablement from old age will leave many of them homeless.

Should there not be at least one great railway hospital and home in this country, with an army of more than half a million working railway men? The question seems to bring its own affirmative answer. Every one will say yes, but the natural question is, Where shall the money come from for this noble charity? This question will probably be answered in the next three months.

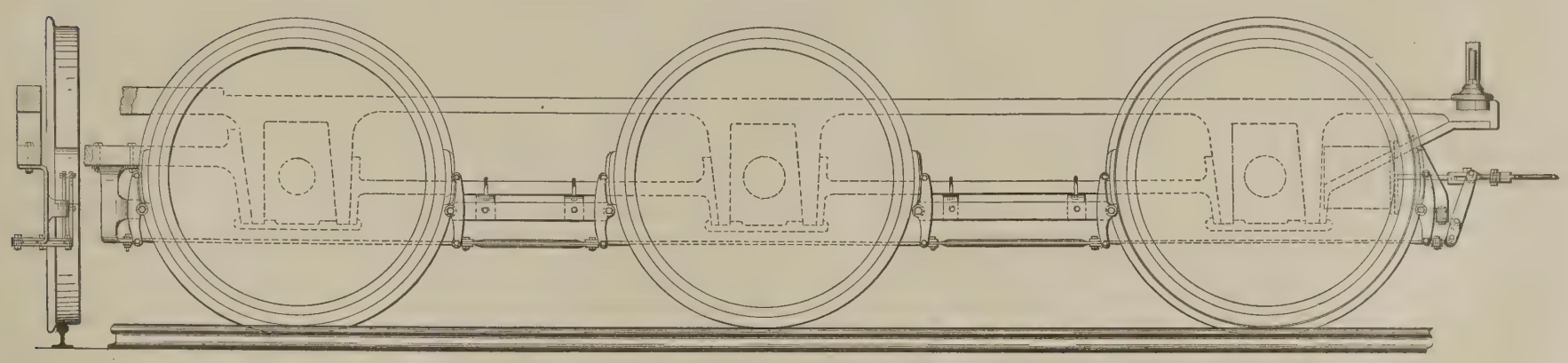
The managers of the great national exhibition of railway appliances soon to be opened, did not originate the enterprise for money making purposes. On the contrary, they are giving their valuable time and labor entirely without pay, and they are personally responsible if the exposition should prove a financial failure. Should it, however, be a financial success they have promised to devote every dollar of the net proceeds to benevolent purposes connected with the railway interest, and the idea of founding such an institution as that referred to seems to be at the bottom of all their plans.

It now remains with railway men and the general public to say whether the dream of these philanthropic men, a great hospital and home for railway employés, to be located wherever it shall ultimately be deemed best, shall be realized, as one result of the exposition. If the attendance is as great as the extent and importance of the display now assured warrant, then the proceeds will be amply sufficient to inaugurate this benificent institution to which railway men from all parts of the country will be welcomed in their times of need. With this prospect in view every railway officer and employé ought to use his best endeavors to swell the multitude which will throng the Railway Exposition during the month of June.—*Railway Age.*

BEALS' IMPROVED DRIVING-WHEEL BRAKE FOR LOCOMOTIVES.



Half Plan.



Section. Side View.

THIS invention is designed to secure a centralizing pressure of brake-shoes upon the driving-wheels of locomotives ; to effect which purpose the shoes are applied to opposite sides of each wheel and in the line of their centers.

The engravings represent a half-plan, side-view and sections of so much of the frame of a Mogul engine as is necessary to show the application and working of the brake. The arrangement will be readily understood, with the aid of the following description :

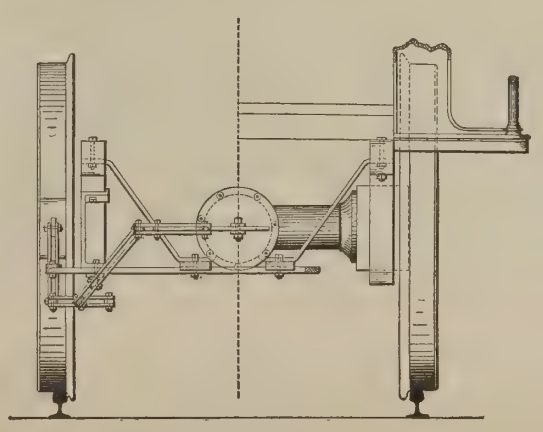
"The method is shown applied to three wheels upon a side ; but is evidently equally applicable to any greater or less number of wheels. With slight changes in form of devices shown, shoes can be placed and operated between wheels having their treads not less than 1½ inches apart, thus admitting the Consolidation type of engines to the benefits of this brake. The brake is preferably operated by but one motor, which may be steam or other, as may be preferred, and which in this instance is shown as being placed under the cab, controlled, of course, by a valve operated by the engineer.

"A simple arrangement of levers, ties and equalizers distributes the pressure proportionably to the tender and locomotive wheels, allotting equal increments to each of the twelve or other number of shoes impinging upon the drivers ; fulcruming each shoe of the system, tank included, upon every other, and all upon the elastic medium of the motor. The broken off tie-rod, shown attached to the long end of the lever which is swiveled upon the end of an equalizer carried by the piston-rod of the motor cylinder, is intended to connect with and operate the ordinary system of tank-brakes. From the short end of same lever, motion is communicated to an upright or partially inclined lever, having a fixed fulcrum, and actuating, through a connection with its lower extremity, the system of locomotive brakes hereinafter described. So that one and the same motion of the engineer's hand applies the brakes simultaneously to every wheel of the tender, and to each side of every driving wheel. It will be noticed that the brake is not fitted with contrivances whereby the tank brake can be coerced into doing work from which the driver brake is exempt.

"The locomotive brake depends or hangs from fulcrum plates which are attached by brackets to the locomotive frame, so that they are in line with the centers of the wheel-treads, and say six inches below the wheel-centers. To these, at each side of each driver, are swiveled rock-arms, placed perpendicularly in the plane of the wheel-treads, each carrying a brake-shoe swiveled to its upper extremity, and each actuated by an equalizer or floating-lever attached, by aid of a quarter-twist link, to its lower extremity. These equalizers extend horizontally inward from the rock-arms. The two that are between contiguous wheels have their centers connected by fulcrum-ties ; whilst the two upon opposite sides of the same wheel have their inner ends connected by operative-ties. The fulcrum-tie at one (the forward) extreme of the system, is securely anchored to the frame ; the power being applied to the fulcrum-tie at the opposite extreme. As the leverages between equalizers and rock-arms are, in the illustration, equal and alike through the series, the pressure upon each shoe (and the result would be the same whether there were few or many), is just one-half of the initial pull upon the tie ; so that a four-ton pull, for example, would communicate four tons of braking pressure to each driver of the series, dividing it equally between the two shoes.

"All connections are carried *behind* the wheels and below their axles. It is, however, evident that the equalizers could be extended outwardly instead of inwardly, as shown, and that connections could then be made *outside* of wheels; or, by extending the rock-arms upward instead of downward, from the shoes, connections could be made *over* the wheels. But, for obvious reasons, neither of these alternatives will commend themselves to practical men.

"Equalizers are not necessary to a brake system. Lateral lines of connections, and shoe actuating levers, can be so combined as to advance or retire each shoe through equal distances, relying upon an equality of shoe abrasion for an equality of shoe pressure. But the faults of this arrangement are too glaring and serious to permit of its adoption ; self-equalization of shoe pressure, is the correct thing in brake construction. The centers



Transverse Section.

upon which the rock-arm swivels are so placed, relatively to the position of shoes and equalizers, that the tendency of weight is to withdraw the shoes from the wheels ; consequently no retraction springs are necessary, and the shoes can be closely adjusted without danger of clattering or of useless and harmful wear.

"The shoes are borne upon the rock-arms which actuate them, so that no hangers are required. There is no interference with wheel-covers, nor with any of the usual attachments of a locomotive. The extension of the system to any number of additional wheels is effected by the duplication of a few simple pieces. Brake-shoes can be arranged to bear above or below the wheel centers ; but, if below, a part of their pressure would necessarily be expended against the vehicle springs, and whether above or below, the effect is to increase the range of movement of the several parts of the brake. There is but one right place for the shoe pressure to be applied, and that is in the line of the wheel-centers, as shown. With shoes so placed, and upon each side of each wheel, all harmful stresses and abrasions are neutralized, permitting the exerted brake pressure to arrest the motion, without injuring the mechanisms of the locomotive.

"It is true that apparent simplification and cheapening can be accomplished by applying but one shoe to each driver. If the retained shoes were all on the same side of their respective wheels, the arrangement would effect a one-sided-wear of boxes and brasses, manifesting itself audibly by pounding at each revolution. But if the shoes were placed, some upon one and some upon the other side of their respective wheels, so that the arrangement tended to crowd the wheels apart, or together, there would result the further detriment that the relative tram of the wheels would possibly or probably be changed, so that the side-rods would prove too short or too long to pass the centers ; with result of broken rod or pin, or of locked and flattened wheels.

"The climax of bad brake practice is, however, the application of brake pressure to some of a series of connected wheels, whilst others of the same series are left free. The rotative energy of the free wheels is instantly converted into a blow, succeeded by a stress, delivered upon the pins and rods connecting them with their fellows ; whilst their frictional energy continues to be exerted alternately from side to side in opposition to the brake friction, inflicting twisting strains and wear upon the boxes. The wheel tires are also exposed to unequal wear, tending to a change in wheel diameters, with consequent slip and aggravation of other harmful stresses. The right way is to distribute the pressure equally upon each side of each wheel and in the line of the wheel centers.

"It is claimed that a brake so arranged does not require to be saved for an emergency, when as likely as not it may be out of order and useless, but can be effectively and harmlessly used in the yard or on the road in lieu of train brakes or of train hands, or in aid of either, and that its use upon an engine one year will save its cost in flues, valves and time.

"This brake has been tested in actual service and is approved in the most unqualified terms by railroad men who are familiar with its performance. Further information in regard to it may be obtained by addressing Wm. B. Guernsey, Agent, Norwich, N Y."

Communications.

Locomotives and Permanent Way.

To the Editor of the National Car-Builder :

Since the first locomotive engine was constructed every attempt to improve the machine has been with a view to an increase of speed, strength and durability, regardless of all other considerations save economy in the consumption of fuel. If engines designed for passenger service have proved satisfactory in regard to speed, and if those designed for freight service have had a superior hauling capacity, with no considerable increase in the amount of fuel consumed in either case, it was considered that at least two important points were gained. Unless these two prime essentials, speed and hauling capacity, had been kept constantly in view, the railway locomotive would not have reached its present degree of perfection. But it may be questioned whether these improvements have not been attended, in the matter of economy, with some serious drawbacks ; or, in other words, whether the economy of a locomotive that can handle the heaviest train without any excessive consumption of fuel, is not more apparent than real. More freight is hauled, of course, there is a saving in the wages of train men, less oil and waste are used, and perhaps less fuel, and by reducing the number of trains there is less liability to butting collisions. But as an offset to these advantages, the increased first cost of engines and the excessive wear and tear of permanent way must be taken into account—the latter being the principal objection to the many coupled monsters that are becoming popular on freight roads. To this may be added the increase of accidents caused by heavy trains breaking in two.

The excessive weight of the freight engines that are now in service on many roads causes excessive surface wear of rails, while the inevitable long wheel-base is productive of rapid flange wear of rails on curves, and the severe lateral and vertical strains cause frequent breakage of rails. The prevalent idea that vertical strains are the principal cause of broken rails is erroneous. The most that can be said is that they are contributory to such results. When tracks were laid with honest iron rails, or rather with rails whose makers were honest, breakages were not as frequent as they now are, even allowing for the increase of traffic. The iron rails would bend considerably in either direction without actual fracture. A severe lateral pressure would merely spread the track and kink the rails, but the rails could easily be straightened and spiked to gauge; but when the steel rails now in use are displaced by a similar pressure, they are pretty sure to break. The *Railroad Gazette* reports for January 23 derailments from broken rails, and 14 from the spreading of rails. The number of breaks was probably increased by the severity of the weather, but the number of spreads should have been, and probably was, diminished from the same cause. In severe freezing weather the spikes hold more firmly in the ties, and the fibers of the wood being more rigid, do not yield so readily to pressure as in wet, moist or warm weather. It would seem, therefore, that the spreading of rails as reported for January last was caused by lateral pressure rather than by the action of frost, and many of the breakages, no doubt, were due to the same cause. Accidents from these causes are on the increase. Those which occur from the spreading of rails may be considered as proof that many coupled wheels

are destructive to the track, while the broken rails suggest the idea of shoddy in the material that goes into them.

In estimating how much work a locomotive can do, its capacity for impairing permanent way should not be lost sight of. If a heavy Mogul can haul a few tons more than a four-driver engine of the American type, her earnings for six months or so will, of course, be more than those of the latter engine. But when account is taken of the damage caused by the Mogul in the way of broken and spread rails, extra wear and tear, strain upon bridges, loss of time in making repairs and other incidental expenses, it will doubtless be found that the eight-wheeler has put as much money in the company's till as its stronger and heavier competitor. The chief advantage claimed in behalf of heavy freight engines proper, with their six and eight drivers, is the greater distribution of the weight, but as this weight is enhanced by from two to four additional wheels, the only gain would seem to be a greater adhesion for moving heavy trains upon grades. But it is not my purpose to discuss the relative merits of the different types of locomotives except so far as the tracks upon which they run are concerned.

The old style of eight-wheel inside connected engines could do more work with less injury to the track than any engines of the earlier or later style. They had a remarkably steady and uniform motion, with little or no lateral oscillation, other than what was caused by inequalities in the track, and the wear and disturbance of track was trifling as compared with what it was with engines of the same type with outside connections. The outside connected engines became popular mainly on account of the accessibility of the parts and the greater convenience of handling in making repairs. They are liked by builders and by those who have to overhaul them; but civil engineers and trackmen see nothing but destruction in their wake, and every wheel that is added increases the trouble. If the mere multiplying of driving wheels increases the power, there should be hardly any limit to the train that a twelve-coupled engine can haul, and the same might be said in respect to the damage inflicted on the track. Designers, builders and users of locomotives are careful to include every minute detail in estimating the economy of whatever pertains to the machine itself, but are prone to overlook the other considerations to which I have adverted. Economy in the consumption of fuel is entitled to all the attention it receives, but it is no more a matter of dollars and cents than are rails, ties, spikes, bridges, wages of trackmen, repairs to ditched rolling stock, to say nothing of injuries to life and limb; all of which should be taken into account in estimating the qualities of a model locomotive. If the tests of railway appliances that are to be made at the Chicago exposition could include the several types of locomotives to which I have referred, in such a way as to show their relative economy of service in their effects on track and road bed, the record of such tests would be exceedingly interesting. But such a record can hardly be looked for.

WM. S. HUNTINGTON.

Transporting Vegetables in Winter.

To the Editor of the National Car-Builder:

There appears to be a demand for a freight car in which vegetables can be transported in winter. A few cars of this kind are now in use in which the heat required to keep their contents from freezing has to be supplied by stoves This, however, makes it necessary to have an attendant to regulate and replenish the fires. For the want of a car in which vegetables can be kept from four to six days in winter without freezing, this class of freight is frequently shipped by express, at rates which prevent dealers from ordering but small quantities at a time, and even then the property is at the owner's risk. This obstacle in the way of large shipments enables speculators not unfrequently to get up "corners" in small towns, and for a time control the market for certain commodities to their own profit and advantage.

A car is wanted in which the temperature can be maintained for a week or so above the point at which vegetables are liable to injury from frost, and at the same time require no attention. The body of such a car would necessarily have to be double, and every means made use of to prevent the loss of heat, which might be generated from a supply of compressed gas carried in a reservoir under the car. The details of such an arrangement might consist of a tank holding gasoline under pressure, to be burned in lamps similar to those now used by car-painters in burning off paint, the whole to be carried beneath the car, with the flame inclosed in a cast-iron box. Steam-heating pipes from the engine would not do, as the freight would be liable to freeze in many cases while being loaded or unloaded, or while waiting to be transferred. The same difficulty would be experienced from the use of revolving iron plates in water, driven by connection with the car axle. The use of chemicals for generating heat would be too expensive for the purpose. Compressed gas or gasoline, as suggested, would probably be the most practicable, as the heat required, if radiation were prevented, would be small. A single gas-burner or lamp will heat a room in a few hours to a high temperature in warm or moderate weather, as almost every one knows from experience.

The gasoline plan for cars seems to offer special advantages. In case the supply of oil should become exhausted it might be indicated by a glass tube-gauge. This the train or station men could be instructed to watch, and when necessary could easily renew the supply, and with a small hand-pump could keep up the required air pressure in the receiver. It is entirely feasible to arrange a tank of this description under the car which would require no attention for a week, and if properly planned, there would be no danger from fire.

DENVER.

English and American Railway Practice.

To the Editor of the National Car-Builder:

The London *Engineer* of a recent date contains an editorial article on "Railway Traffic in the United States," in which I find the following statements:

"In this country (England) the carriage of goods and minerals is subservient to the passenger-carrying business; but in the United States the converse is the case. In this country all our great lines are crowded with passenger trains; in the United States the passenger trains are comparatively few, while the goods trains are large and numerous. Here it may be said that goods have to give way to passengers; on the other side of the Atlantic, although it would not be true to say that the converse holds good, it is at least certain that the two classes of traffic have nearly equal rights of way."

As these assertions are positive, and as the *Engineer* is a high authority in railway matters in England, if not in this country, I take the liberty of pointing out some important errors in the above paragraph, which, if allowed to go uncorrected, would convey a wrong impression to those who read it. As to the nearly equal rights of way of passenger and freight trains on the roads of the United States, the statement is refuted by the following quotations from the rules printed on a time-card, and governing the movement of trains on one of our prominent lines of railway:

Rule 4. Freight trains, as regards each other, will be governed by rules 1 and 2, but must always keep out of the way of passenger trains. No conductor or engineer of a freight train will be allowed to assume any rights, or take any of the time of a passenger train unless on special orders from the train dispatcher.

Rule 9. All regular and extra freight, stock, wood, track, and every class of trains other than passenger trains, must keep out of the way of passenger trains.

Portion of Rule 11. Passenger trains are the first consideration, and must receive all assistance possible from all employés, and from other classes of trains, to help them over the road.

Portion of Rule 13. Trains other than passenger, have no rights as against passenger trains, save when running on telegraph orders from the train dispatcher.

The statement that the passenger trains are comparatively few, while the goods (freight) trains are large and numerous, is true only in respect to freight trains. From the same time-card I find that the regular freight trains are numbered up to 42, and the passenger trains to 36. In a large Western city, in which there are depots of six different roads, one road runs passenger trains of an accommodation order so frequently, say at intervals of three or four minutes, that the regular engineers in arriving and departing, have to take a pilot for a distance of six miles, the passenger trains being so numerous that a regular road engineer cannot keep track of them so as to keep out of their way.

The fact that one of our roads is said to have had one of its cars away for nine weeks on other roads, is cited by the *Engineer*, in the same article, as something remarkable, when the truth is that if the home roads could get all their cars back again in that short space of time, it would be considered a great piece of luck.

The *Engineer* asks, in summing up, "Have British traffic managers anything to learn from their American brethren?" and answers, "On the whole, very little." Considering the comparative territorial dimensions of the English and American systems, the answer is very pertinent. One of our western farmers, if he had a genius that way, could operate the English system in his back yard and still have a little room left for new construction; but the traffic managers of our great continental lines would hardly go to the said back yard for instruction. The *Engineer* reiterates the old threadbare assertion that American locomotives are much less economical in the consumption of coal than English engines. What comparison is there, I would ask, between the miniature carriages of an English train and the dining, sleeping and drawing room cars that compose the trains on our roads? An English passenger coach weighs from 7 to 10 tons, and carries from 24 to 32 passengers; and about 15 of these coaches make a train. An American coach weighs from 25 to 30 tons (a sleeper about 40) and seats from 60 to 70 passengers. From 8 to 10 of these coaches, exclusive of baggage, express and mail cars, make an average train on our leading through lines, and the aggregate weight is three or four times as much as that of an English train. What headway would an English passenger locomotive, restricted to its regular home rations of coal, make with one of these trains? To borrow a phrase, I should say, "On the whole, very little."

As regards speed, it appears that the average of express and fast passenger trains on the New York Central is fully up to the average of English trains, while the trains on the Bound Brook route between New York and Philadelphia, which are heavier than the English fast trains, make still better time. Webb's compound engine, which is admitted to be the most economical type of engine in England, burns 23 pounds of coal per mile; but I could name an American engine with 16 × 24 in. cylinders that runs an accommodation train and burns only 20 pounds of coal per mile. With the same indifference evinced by the *Engineer* to weight of trains, I can claim that this beats Webb's compound.

YANKEE.

Counterbalancing Driving-Wheels.

To the Editor of the National Car-Builder:

A writer in one of the technical journals expresses the opinion that more harm than good results from balancing the reciprocating parts of an ordinary locomotive. However plausible the hypothetical reasoning may be in support of this opinion, its correctness is not sustained in practice. I have had much experience in handling both balanced and unbalanced engines, and have always been glad to exchange the latter for the former. The worst case in my experience was that of an unbalanced Mogul, which, at every revolution of her wheels at any speed over six miles an hour, took the slack up suddenly between the tender and foot-board, and as suddenly dropped it, thus causing the engine to move ahead by a series of short, sharp jerks on the draw-bar. The effect was to render it impossible to keep the rods keyed up or the driving-boxes in shape. The body of the engineer, above the waist, was jerked forward and back at each revolution; if he leaned against the back-board of the cab he was pounded against it, or if he put his head out of the window, his neck muscles were sorely taxed to keep his head from striking first one side and then the other. Engineers shunned her as they would a pestilence. Six months' service on her brought on pains in the back and kidneys. The draw-bar between the engine and tender would wear so thin in a few months as to break through the eye. The master mechanic at length took the engine into the shop and concluded to balance her. He was a man whose capacity was derived more from practical experience than from a knowledge of principles. He commenced by bolting into the spokes of each wheel, opposite the crank-pins, an iron weight, the result of which was a big improvement. Then a heavier weight was tried, followed by more improvement, and so on until the engine was properly counterbalanced. There was then no more jerking on the draw-bar, and she became a favorite, as she was a good steamer and handled easily. If the writer above referred to had ridden on that engine before and after the balancing, he would have had reason to change his opinions. But had he been the master mechanic of the road, his belief in the controlling efficacy of principles and mathematics might have prevented the counter-balancing, regardless of sore backs and worn or broken draw-bars.

I have ridden, in one capacity or another, on more than 500 engines, and have always found that those which kept a steady and constant strain on the draw-bars invariably had their reciprocating parts balanced, and *vice versa*.

REACH-ROD.

Locomotive Performance on the Kentucky Central Railroad.

To the Editor of the National Car-Builder:

The December number of your journal contains an illustrated article in reference to the extension smoke and brick arches in use on the locomotives of the Cincinnati, New Orleans & Texas Pacific Railroad. The figures therein contained, showing comparative cost of building and economy in use, have prompted some of the boys connected with the Kentucky Central road to investigate the merits of the non-extended front engines of this road. The two roads run parallel with each other between Covington and Lexington, and the following is a statement of the performance of passenger engine No. 5, as contained in the monthly report of Mr. A. H. Watts, the master mechanic of the last-named road.

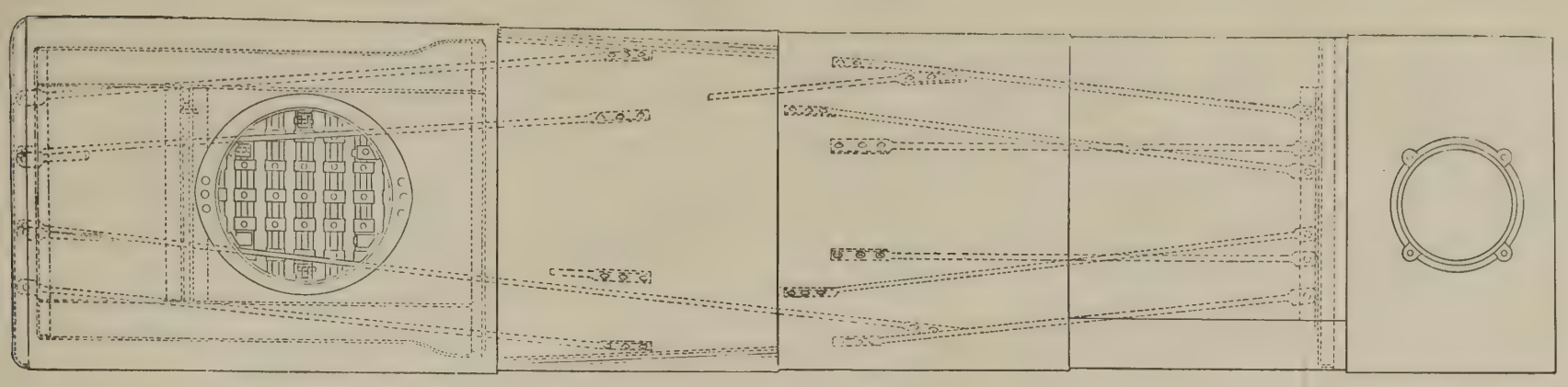
The engine was built at the Baldwin Works, has 17×24 cylinders, a brick arch in fire-box, and a straight stack with 4¼ nozzle. During the month of February she ran 4,000 miles between Covington and Lexington—the distance between the two places being 100 miles—and consumed 117,000 pounds of coal, or an average of 29.25 pounds per mile run. The number of cars hauled each trip ranged from four to six; 24 mail train trips were made with 34 regular stops each, and 16 fast line trips with six regular stops each, making a total of 912 stops, or an average of nearly 23 stops per trip.

VERITAS.

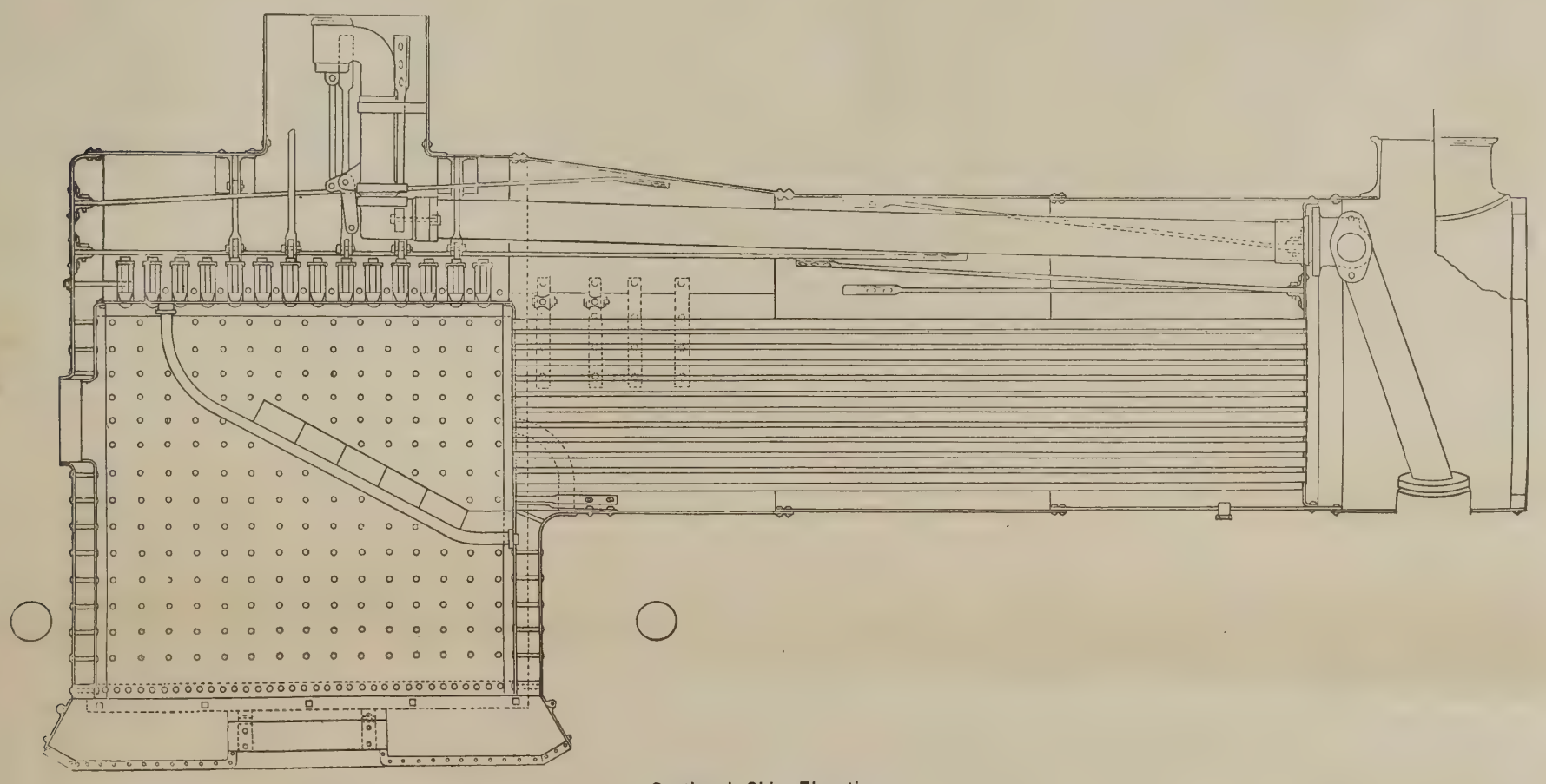
SUPERINTENDENT NEILSON of the Buffalo & Rochester Division of the Erie road has a private car which looks from the outside to be an ordinary caboose, excepting that it is painted a little brighter and that it is supplied with air brakes and an observation platform. The platform is fitted with gaies and doors. The end of the caboose has been moved in about five feet and has been fitted with large windows. Inside is the superintendent's office, fitted up with an old desk and several cane-seated chairs. Beside the desk may be seen the superintendent's rubber boots spattered over with mud, showing that he has been doing some walking through the country. Matting has been used on the floor instead of carpet. The walls are painted drab color, while the ceiling is light green. On the other end of the car are the men's quarters, two seats extending along the side for their accommodation. A lavatory and closet are among the conveniences. A clear-story to enable the superintendent to inspect the line is fitted up in the same style as the rest of the car. Underneath the car a locker for carrying supplies is placed.

BOILER OF STANDARD EIGHT-WHEEL FREIGHT AND PASSENGER ENGINE

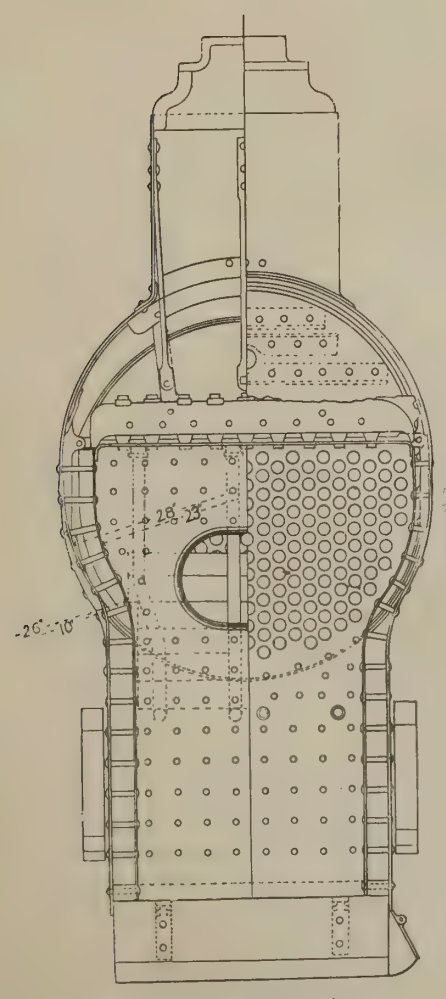
Louisville & Nashville Railroad.



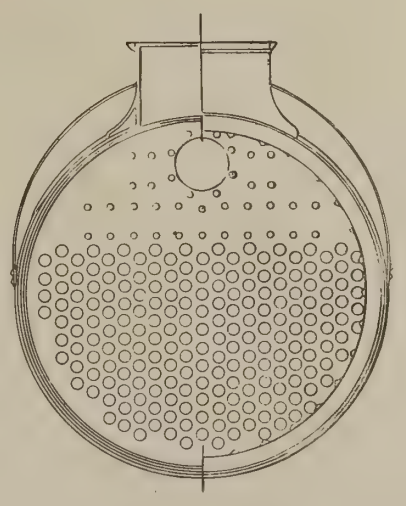
Plan.



Sectional Side Elevation.



Back Sectional Elevation.



Front Sectional Elevation.

DIMENSIONS, ETC.

Length of boiler	21 ft. 0	in.
Diameter of barrel	54	"
Bottom of mud-ring to top of boiler head	93⅞	"
Width of fire-box at grates	34½	"
Height of fire-box	68¼	"
Length of fire-box inside	72⅛	"
Length of fire-box outside	81¼	"
Center of back axle to fire-box	7	"
Center front axle to fire-box	19¾	"
Width, side water leg	3½	"
Width, back water leg	3½	"
Width, front water leg	4	"
Height of dome	24	"
Diameter of dome inside	28	"
Diameter of dry-pipe	6⅛	"
Number of flues	201	
Center to center of flues	2 11/16	in.
Length of flues	11 ft. 5½	"
Diameter of flues	1⅞	in.
Width of fire-door	14	"
Length of fire-door	20	"
Bottom of mud-ring to swell of fire-box, outside	40⅛	"
Horizontal length of wagon top	42⅛	"
Back end of boiler head to center of dome	47½	"
Depth of ash-pan	10	"
Length of side ash-pan door	28	"
Top of rail to center of boiler	77 1/16	"

SHEETS ALL STEEL.

	Length. Inches.	Width, Inches.	Thickness. Inches.
1 Barrel sheet	172	51	7/16
1 Barrel sheet	175	51	7/16
1 Smoke box	172½	34	7/16
1 Slope	52½	60 and 72	7/16
1 Roof	100	76¼	7/16
2 Side	76¼	68	7/16
1 Back head	98⅛	53 and 66	7/16
1 Throat	52	53 and 70	7/16
1 Front flue, diam	58		7/16
1 Waist	120	49	7/16
1 Dome	91	31	7/16
2 Side	72	70	5/16
1 Crown	72	50½ and 55	5/8
1 Door	70½	40 and 50	5/16
1 Flue	70½	40 and 54½	7/16

SUPERINTENDENT HOBART, of the Vermont Central, says that the agitation of the color-blind question has so been productive of no good results to railroads, but, on the other hand, great injustice has been done to employees by throwing the most reliable and faithful out of employment to to gratify the whims of those who are led by their impracticability, sentiment and the influence of others, to believe the safety of the public requires it. President Watrous, of the New York, New Haven & Hartford, also says in reference to the visual capacity of railway employees, "what we want to know is, can he clearly and unerringly distinguish red, white and green, the one from the other? No branch of his business in our service requires him to be able to match worsteds."

Abstract of the Lake Shore & Michigan Southern Railway Report of Mileage made by Wheels removed from Engine, Tender and Passenger Equipment, during 1882.

Wheels removed, including worn out and defective.	Total mileage of all wheels removed.	Greatest mileage of worn out wheels.	Least mileage of worn out wheels.	Average mileage of worn out wheels.	Average mileage, including worn out and defective.	New wheels put under.
2,265 (33 inch)	137,213,874	500,300	20,236	71,951	60,580	3,691
747 (30 inch)	42,966,753	171,890	35,725	64,749	57,519	565
393 (28 inch)	22,042,416	154,119	4,036	62,652	56,088	417
6 (26 inch)	583,782	136,058	49,979	97,297	97,297	22

Miles run by Engine, Tender and Passenger Equipment Wheels, removed during five years, 1878-79-80-81-82.

Wheels removed.	Total mileage.	Average mileage.	New wheels put under.
10,211 (33 inch)	616,077,212	60,335	16,829
6,096 (30 inch)	294,435,655	48,299	5,506
1,899 (28 inch)	94,697,048	49,867	7,581
39 (26 inch)	2,491,231	63,878	65

Recapitulation of 33-inch Wheels worn out in five years.

Number of wheels.	Total mileage.	Average mileage.	New wheels put under.
7,050	500,964,738	71,059	16,829

33-inch Wheels reported flat by sliding, during five years.
Not included in foregoing because not the fault of iron or manufacture.

Number of wheels.	Total mileage.	Average mileage.	
747	17,976,564	24,065	....

NOTE.—This report represents the minimum mileage, as no allowance has been made for switching, except in case of shifting engines, which is estimated at six miles per hour when in steam.

The above is condensed from the annual report of wheel performance prepared by Mr. A. C. Armstrong, the Purchasing Agent of the road. The wheels referred to in the report are of five different makes, the names of the makers not being given. The form of these reports being the same every year, we are able to give the following comparative results for the past four years:

	1879.	1880.	1881.	1882.
Worn-out wheels removed	2,243	2,751	2,896	2,519
Broken tread and seams	330	173	155	85
Flat (bad chill or crumbling tread)	622	673	840	669
Sharp flange	190	201	126	113
Broken plate	6	2	31	25
Total number wheels removed	3,391	3,800	4,048	3,411
New wheels put under	4,688	4,700	6,144	4,695

Average mileage of 33-inch wheels worn out:

From 1878 to 1882 inclusive	71,059
From 1877 to 1881 inclusive	67,593
From 1876 to 1880 inclusive	63,134
From 1875 to 1879 inclusive	59,130

From this it appears that there were 637 more wheels removed from all causes in 1881 than in 1882, while during the latter year there was a falling off of 1,449 in new wheels put under. It also appears that the average mileage increased from 59,130 during the five years ending with 1879, to 71,059 during the five years ending with 1882, which is a gain of 11,929. This indicates a steady, but not a very marked improvement in the quality of cast-iron wheels during a period of seven years, so far as appears from the record of this road. This record is kept so as to show the mileage of each wheel in the engine, tender and passenger equipment, the date when put under and when removed, and the cause of removal. No wheels are transferred from passenger to freight service. The object of this record, and the wearing out of wheels in passenger service, is to ascertain, on the basis of actual mileage, the merits of the wheels made by different manufacturers, and also whether each wheel makes its guaranteed mileage. A 33-inch wheel is considered "worn out" when it has run 50,000 miles, or when the chill is worn through in more than two places, although it may have run very much less than that distance. There are, of course, many exceptional wheels that make a much greater mileage than this before they are actually unfit for service, while many fail to make their guaranteed mileage, and many of these are removed for defects that are not the fault of the metal or the making, but are the results of ill-usage in one way or another.

Ornamentation.

Are we retrograding in art? This question comes uppermost in our mind as we view the ornamental work of to-day, and particularly that of the painter. Here we see what is termed the "esthetic style," which is of comparatively recent origin, many hints and directions being given in a work brought out by Mr. Charles E. Eastlake, of England, entitled, "Hints on Household Tastes." This *style* is not a classified "order," as that of sculpture or architecture; it has no definite principles of treatment and rules of application or delineation. It is so unrestrained in its requirements that the wildest conceits of the uneducated pretender may be imposed, and the most absurd and distorted features defended as "in keeping with the style." It may be advantageous to the artist to cater to the whims of the lah-de-dah aristocrat, and if need be, lower the scale of his profession to meet their requirements; but in doing so he is "cutting off his nose to spite his face." The school boy will often produce upon his slate a more meritorious design than many we see on what ought to be good work, and it should be the aim of the true ornamenter to discountenance this innovation upon his trade, as it takes from him the value of all his years of practice, and brings his handiwork down to a scale at par with the dauber. The true Roman scroll is becoming obsolete, owing to the introduction of these "Eastlake," "Japanese," "Esthetic" and "Queen Anne" "styles;" and who is there among *real artists* who will deny the fact that skill and long practice must be brought into play to produce such work as that which once gave beauty to our walls and ceilings? The graceful "sweeps," the intertwining stems and leaves, the harmonious coloring, could not be produced by the amateur, nor by any one who had not studied long and well to master the art.

The series of fresco designs which are about to be published in these columns will the more readily appeal to those interested in the trade to use their aid in lifting the pall which now hangs over art, and bring them back to the standard they have drifted from to please the admirers of pug dogs, Chinese tea cups, and other Wilde esthetic-ism.—*Painters' Magazine.*

A New Boston & Albany Passenger Train.

The car shops of the Boston & Albany road, at Allston, Mass., have just completed a train of new cars which it is designed to put on between Boston and New York. The train is composed of two drawing-room cars, two passenger coaches, a baggage car and a smoking car. They are all 57 feet in length. The drawing-room cars are finished inside, both sides and roof, in mahogany, the ornamentation consisting of a limited amount of carving, which gives to the car a plain appearance without detracting from the richness of the material. There are 24 revolving chairs, and stationary seats for nine persons besides. The upholstering is in old gold silk plush. At one end of the car is the gentlemen's closet and one of Searle's hot water heaters. At the other end is a retiring room for ladies and a lavatory, the latter having a large water tank above and a faucet instead of a pump letting the water into the wash bowl. Adjoining the ladies' room, but in the main saloon, are two comfortable seats facing each other and capable of being quickly made into a bed and separated from the rest of the car by a handsome curtain—an arrangement that will be appreciated by invalids who have occasion to travel on the train. The floor has a Wilton carpet, which harmonizes with the upholstery. Each car is lighted at night by four of Williams, Page & Co.'s double-burner chandeliers of polished bronze and beautiful design.

The passenger coaches and smoking car are finished in cherry in the same general style of ornamentation as the drawing-room cars. The windows have curtains instead of blinds. These cars seat 76 persons each. The seats of the smoker have leather cushions and rattan backs Those in the coaches are upholstered in old gold mohair; and all three have Wilton carpets, and are lighted by ten lamps each, similar to those used on the suburban cars of the road. All the cars have 4-wheel trucks with 42-inch Allen paper wheels, Cliff & Righter's "acme" springs, Globe ventilators, and Westinghouse brakes. A trial trip was made with the train on the 11th ult., a number of prominent railway men being on board. —the result was the easiest kind of riding, not even excepting the baggage car. The cars have been built under the superintendence of that veteran passenger car builder, Mr. F. D. Adams, the General Master Car-Builder of the road, whose strong point is to have his cars light in weight as well as handsome and commodious. Indeed, if it were not inconsistent with the prevailing styles of passenger car decoration, he could well afford to stencil the weight of each car on one of the outside panels for the edification of railway men who have not become indifferent to the dead weight problem.

The train, it is said, will run alternately with a train that is now being built by the New York, New Haven & Hartford road, and that the two will be termed "The Limited Express" between the two cities above named.

Recent Reports of Railway Rolling Stock.

Atchison, Topeka & Santa Fe.—348 engines; 105 passenger, 2 chair, 35 emigrant sleeping, 70 baggage, mail and express 4,364 box, 717 combination, 901 stock, 925 flat, 2,351 coal and 113 caboose cars; 3 officers' cars, 2 pay cars and 19 road and service cars—total cars, 9,607. The company also owns one-half interest in 22 Pullman sleeping cars used on the road.

Chicago, Burlington & Quincy.—522 engines; 284 passenger, 1 state-room, 5 dining, 105 baggage, mail and express, 14,425 box and stock, 4,119 flat and coal, and 257 caboose cars; 8 officers' and pay cars, 9 boarding, 7 wrecking and 5 pile-driver cars; 910 hand-cars and 642 rubble and iron cars—total cars, 20,726.

Chicago & Alton.—213 engines; 105 passenger train cars 3,323 box, 1,348 stock, 1,360 flat and coal, 97 caboose and drovers, and 16 cars. There are also 19 Pullman cars in regular service on the road—total cars, 6,149.

Hannibal & St. Joseph.—76 engines; 21 first-class, and 8 second-class passenger cars, 4 reclining-chair cars, 7 mail, 2 mail and baggage and 9 baggage cars; 9 refrigerator, 697 box, 420 combination, 81 stock, 46 flat, 434 coal and 36 caboose cars; 1 director's car, 1 pay car, 3 derrick and wrecking cars and 1 pile-driver; 6 velocipede hand cars, 58 hand and 61 rubble cars—total cars, 1,906.

Housatonic.—24 engines; 27 passenger, 3 mail and smoking 9 baggage, 533 box, 14 hay, 329 flat, 3 caboose and one wrecking car—total cars, 843.

Missouri Pacific.—680 engines; 461 passenger train cars, 18,510 freight, and 180 service cars. This includes equipment on Central Branch; Mo., Kan., Tex.; Int. & G. Northern; Tex. & Pacific; and St. L. I. M. & So.—total cars, 19,151.

New York, Ontario & Western.—73 engines; 32 passenger, 8 second-class passenger, 20 baggage, mail and express, 454 box, 13 milk, 62 stock, 622 flat and 634 coal cars; 27 service cars—total cars, 1,872.

New York, Pennsylvania & Ohio.—217 engines; 78 passenger and 19 combination, 3 postal and 41 baggage and express cars; 3,520 box, 502 stock, 3,093 flat and coal and 108 caboose cars; 1 private car, 1 pay car and 20 service cars—total cars, 7,386.

St. Louis, Vandalia & Terre Haute.—38 engines; 14 passenger, 8 baggage and 2 express cars; 823 box, 308 stock, 100 flat, 253 coal, 89 gravel and 21 caboose cars; 14 service cars—total cars, 1,632.

St. Louis & San Francisco.—79 engines; 33 passenger, 2 combination, 5 postal and 11 baggage cars; 1,187 box, 485 stock, 20 flat, 1,000 ore and 43 caboose cars; 2 officers' cars, 1 pay car, 5 boarding, 2 tank and 2 wrecking cars—total cars, 2,798.

Union Pacific.—344 engines; 84 passenger, 39 sleeping and 79 baggage, mail and express cars; 3,871 box, 25 refrigerator, 909 stock, 748 flat, 1,171 coal and 197 caboose cars; 7 officers' cars, 3 pay cars, 13 construction and 6 water-tank cars—total cars, 7,234.

Locomotive Performance.

The following is a statement of the performance of locomotives on the Pittsburg, Cincinnati & St. Louis Railway for the year ending December 31, 1882:

Total miles run on passenger trains	915,943
" " " " freight "	2,061,310
" " " " ballast "	101,525
" " " " switching "	592,509
Total miles run	3,671,287
Total passenger car mileage	5,572,378
" loaded freight car mileage	37,046,101
" empty " " "	6,899,145
Total car mileage	49,517,624
Average cost per mile of passenger engines	13.72
" " " " " freight "	19.80
" " " " " ballast "	16.03
" " " " " switching "	11.31

This includes cost of repairs, fuel, stores, engineers and firemen.

Number of engines in service	102
Average mileage per engine	35,993

Percentage of empty freight cars of all hauled, 15 8-10.
Five empty freight cars rated as three loaded cars.

Cost per mile run for repairs	6.56
" " " " " fuel	4.01
" " " " " stores	0.56
" " " " " enginemen and firemen	5.45
" " " " " cleaners	0.33
" " " " " all other motive power accounts not included in above	3.06
Total cost per mile run	19.97
Total of all motive power expenses	$733,205.26
" cost of cleaners	12,244.75
" " " other motive power accounts	112,351.07

Coal rated at $1.05 per ton of 2,000 pounds. Wood at $2.28 per cord

	Pass.	Fr'g't.	Bal'st.	Swit'g.	Gen'l.
Av'ge No. miles run to 1 ton of coal	41.89	21.63	34.53	46.51	27.59
" " " " " 1 quart of oil	42.42	33.70	43.08	37.66	36.37
" " " " " 1 lb. of waste	114.07	179.63	128.56	157.16	154.57

	Passenger.	Loaded freight.
Average number of cars each draft	6.08	20.15
Total average cost each car per mile	2.25	0.98
Pounds coal consumed per car per mile	7.87	4.62

The total average cost each car per mile includes all expenses of road engines in or out of shop, but does not include expenses of switching, construction or ballast train engines.

IT is claimed in behalf of the "Fort Wayne Freight-Car Coupler" that it is so simple in construction that a child can manage it; that it has strength and resistance where these qualities are most needed; that it can be coupled with any draw-bar in use; and cost but a trifle more than an ordinary draw-bar. The operator, standing outside, at the end of the car, can guide the link fully 45 degrees by the slightest pressure of the lever. The pin is held and dropped automatically, and can not be detached from the draw-bar and lost. The link is always in the right position, and can not be broken when the cars are violently banged together. Only two small pieces of iron and two bolt are used in the entire construction; no forgings are required, only three holes are to be punched, and one drilled. The link and pin, it is claimed, must always be used in the coupling of freight cars, in order to provide the requisite "slack" between the draw-heads. Total weight of appliances about 18 pounds. Nirdlinger & Heath, patentees and proprietors, Fort Wayne, Ind.

DROP-BOTTOM COAL CAR—NEW HAVEN & NORTHAMPTON RAILROAD.

Designed by John Sweeney, Foreman of Car Department.

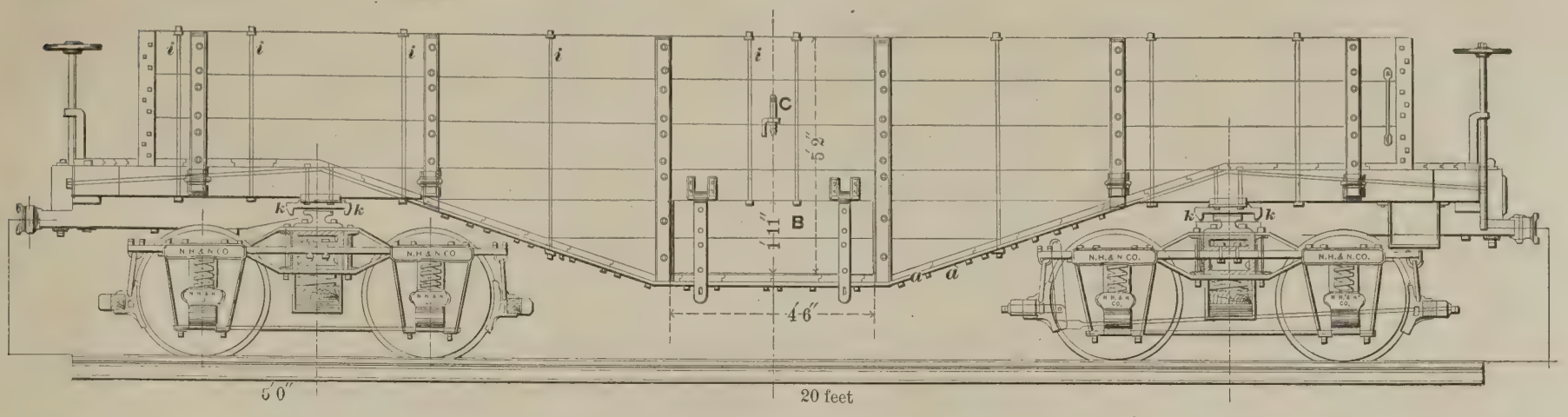


Fig. 1.—Side Elevation.

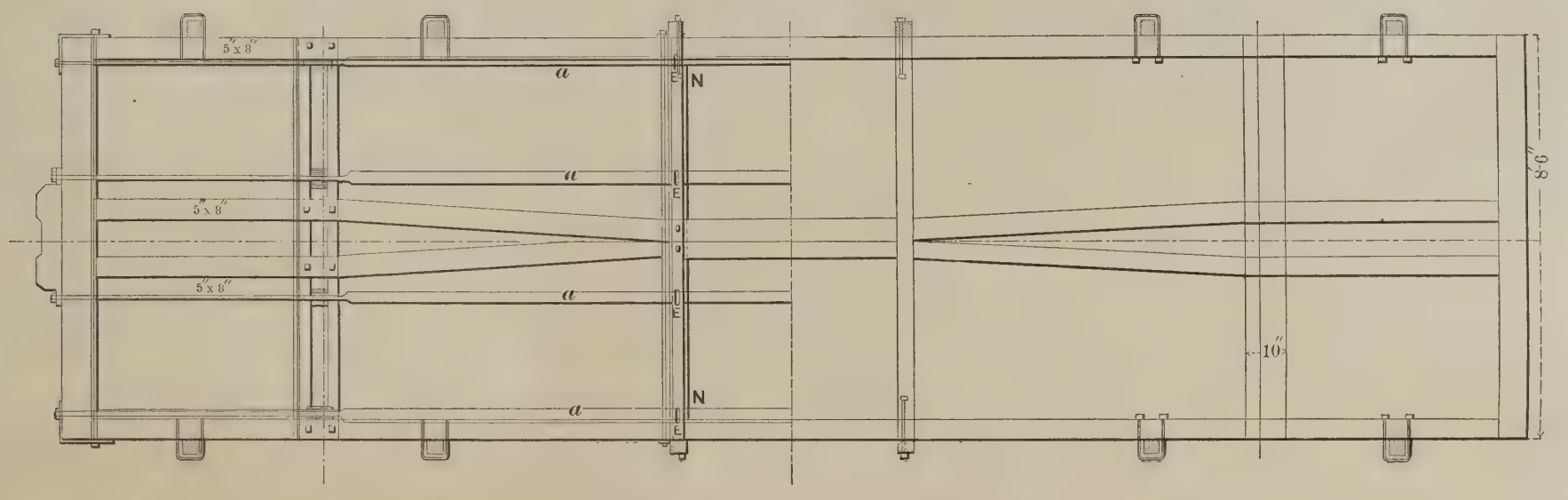


Fig. 2.—Plan, Showing Floor Timbers.

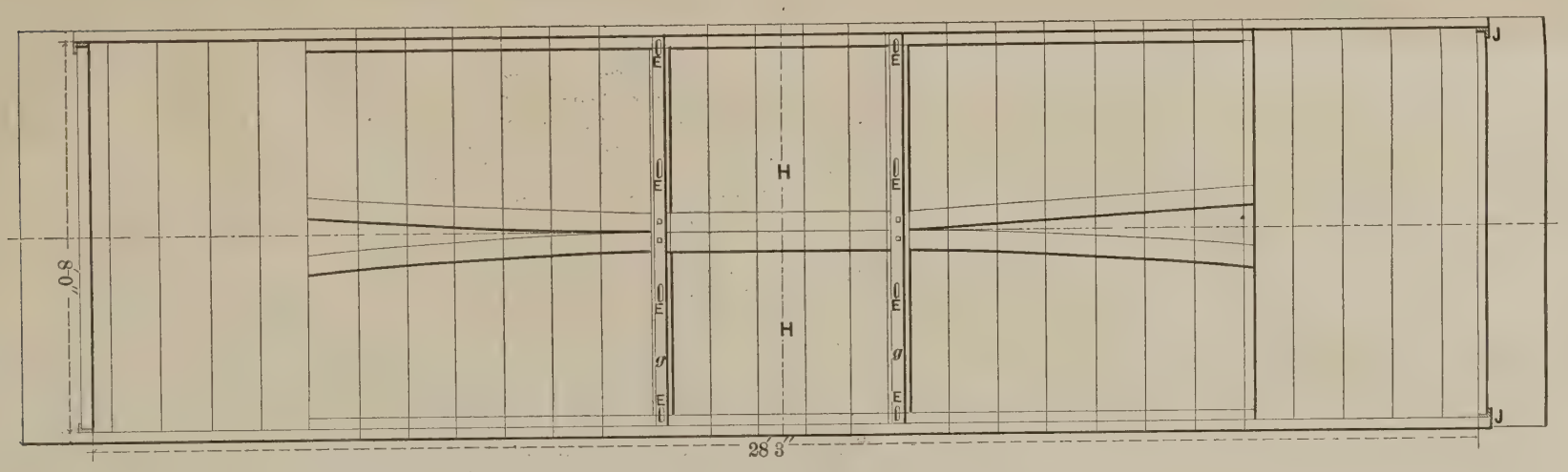


Fig. 3.—Top View, with Flooring and Side Boards in Place.

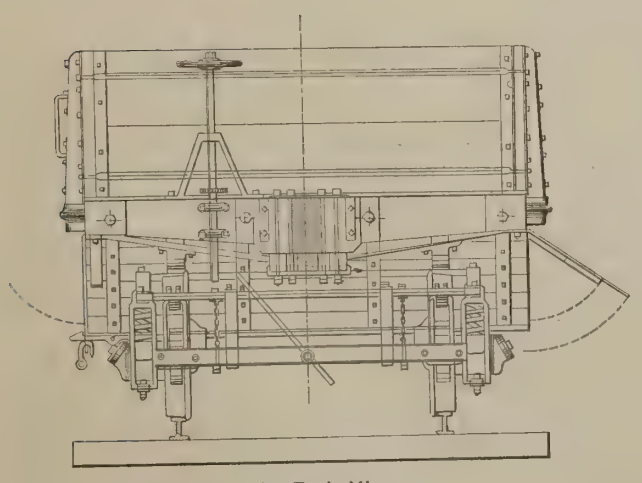


Fig. 4.—End View.

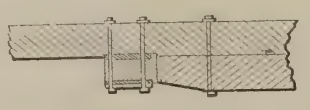
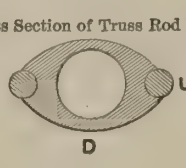


Fig. 6.—Section through Draw-Timber.



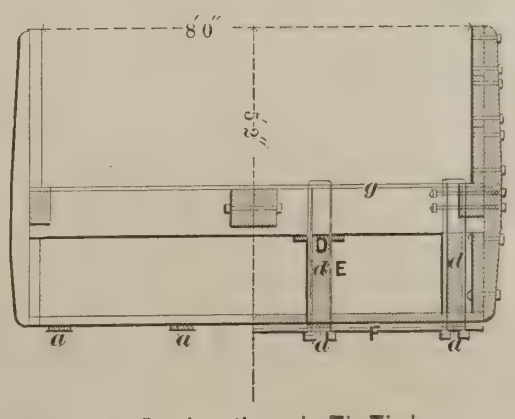


Fig. 5.—Section through Tie-Timber.

DIMENSIONS AND CONSTRUCTION.

Length over sills	31 ft. 0 in.
Width over sills	8 ft. 5 in.
Length inside of side boards	28 ft. 3 in.
Width inside of side boards	8 ft. 0 in.
Height of side boards above sills	2 ft. 9 in.
Size of longitudinal sills	5 × 8 in.
Size of end sills	8 × 7 in.

Capacity of drop-bottom below sills..... 5 gross tons.
Total capacity of car..... 56,000 lbs.

The truss-rods *a a*, where they run below the sills, are made of flat iron, to which the round ends are welded. In the central part of the car these rods are allowed to drop as low as possible and clear the truck frames. The flooring between the body-bolsters is of 2-in. oak plank, and is laid and firmly bolted to the flat portion of the rods with ⅛-inch carriage bolts. The doors *B* give access to the drop-bottom, and are hinged to side sills, opening upward and outward, and held open by the catch *c*. Between the truss-rods and tie-timbers are placed the pillar castings or body truss-rod bearings *D*, shown in section. To connect the truss-rods and sills, U bolts, *E* Figs. 3 and 5, are used, which pass down through the tie-timbers through grooves or channels in the sides of the bearings, and through a flat strap *F* below the truss-rods, and are there secured by double nuts, as shown. There is a

corresponding flat rod on the top side of the sills, which serves as a washer for the U bolt, and binds the frame firmly together. There are six ¾-inch cross-rods located as shown. In the center, between the tie-timbers, the center sills are drawn together to make room for a man to work in the opening, *H H* Fig. 3.

The side boards are 2½ inches in thickness, and are fastened to side sills by bolts, *i i* Fig. 1. The side and end boards are connected at the corners by a light angle-iron, as shown in Fig. 3. The body bolsters are ¾ × 10 in. iron plates, and are notched into the sills ½ an inch. The body side bearings are made with lugs or stops *k k*, arranged so as to catch on to the truck bearings and prevent the truck from turning in case it should leave the track—practically a substitute for check chains. Pockets for the center-stakes are omitted on account of the door, and in their place are used joint bolts, one or more, which pass through the stakes and sill, and into nuts *N* mortised into tie-timbers, which come up even with top of sills, and are made preferably of two or more pieces. Fig. 6 represents a thimble or division casting, with shoulders bearing against the edges of bolster plates, and against this casting is placed the end of the draw-timber.

The Trucks are what are known as continuous frame trucks. They have swing-bolsters and channel-bar transoms with a center casting. The channel bars are notched to receive the frame. Instead of making the frame in one piece (which is rather an expensive forging), it is made in two parts which meet in center of truck, and are there secured to center-castings by bolts, as shown. Main frame is of 3 × 1¼-in. iron, and arch-bars of 3 × ¾ in. The pedestal tie-bar, instead of being bolted, as it usually is, to the under side of pedestal, is passed through openings in the pedestal and hooked down on the lower plate and there bolted. This arrangement is calculated to relieve the bolts of the weight and vibration of the bar, and so make it less liable to get loose. The M. C. B. standard journal-box and axle are used, with some slight modifications which do not affect their interchangeability, the axle being ⅜ in. larger in the center than the standard. The center truck castings have flanges which cover the ends of channel-bars in the finished truck. These flanges are left out of the drawings in order to show the construction and arrangement of the parts.

This car has been in active service since early in December last, carrying loads of 25 gross tons, and as yet shows no signs of having been overloaded.

An Experiment with Follower-Bolts.

We witnessed a few days since an interesting experiment in relation to follower-bolts. An engine that had recently been fitted with new pistons was detained because the lugs for the bolts cracked when the bolts were screwed in. The metal around the bolts was not as heavy as usual, and the fit was tight. After screwing the bolts in about two-thirds their length, the lugs cracked lengthwise. The following explanation of the matter was offered by an old and experienced machinist: The bolt when screwed down is a tight fit in the threads, because the air underneath is compressed, the pressure thus created being sufficient to to burst the lug. The apparent tightness of the fit is due to a great extent to the resistance of the compressed air. To prove this, he took one of the bolts, and with the corner of a file cut a notch like a key-way in it lengthwise, after which he screwed it in with comparative ease with his fingers, the notch allowing the air to escape. To prevent a follower-bolt from riveting, they are usually oiled, but as lard oil develops an acid, the bolt frequently corrodes and twists off, when after a time it is necessary to take it out. If, however, the bolt is smoked until a coating of soot is formed on it, or if it is rubbed with plumbag, it will come out, in case it is a good fit, with no signs of corrosion, even when it has been in place for years; the philosophy of which is that soot or plumbago is largely composed of carbon, which is practically unaffected by the changes which cause lard oil to corrode when heated.

National Exposition of Railroad Appliances.

The following circular is issued by the Secretary, under date of April 14, to exhibitors:

It is desired that exhibitors will particularly notice that portion of Rule IV. which requires allotments of space to be *occupied on or before May* 20, and that they will earnestly aid the management of the Exposition in its determination to have every thing in complete readiness on the opening day. That an exposition founded upon and devoted to railway interests should illustrate, among other things, the promptness and accuracy so essential to the management of railway affairs, is a fact that must appeal with special force to every exhibitor, and that will certainly be appreciated by the railway people of the country and by the general public. To this end it is earnestly requested that the preparation of exhibits, and their early delivery at the Exposition building, *be not prejudiced by any delays possible to be avoided.*

Such is the character of the bulk of exhibits that considerable time will be required in putting them in place, and any delays which might postpone the completion of the work until after the opening hour would produce confusion and jeopardize the completeness of the success that now promises to be without a parallel.

There is every indication that the attendance will be very large from the opening day. In fact, one of the most important meetings of railway officials to be held in this city during the Exposition has been called to convene before the first week of its existence shall have passed. Then, too, it is proposed to make the opening exercises an event of much importance and great interest, increasing the necessity of having every thing in place and in perfect order on the day named.

Exhibitors can not fail to realize that not only the public, but themselves will be sufferers from any delays, and it is believed to be only necessary to suggest to them the great importance of promptness in this matter.

Reasonable forethought and timely action will avoid all embarrassments, and make this Exposition, in every respect, a remarkable success.

The Exposition building is now open for the reception of exhibits and for the making of such preparations as exhibitors may desire.

The Commissioners rely upon the hearty coöperation of exhibitors in producing this important result.

A BAGGAGE CAR 52 feet long is being built at the shops of the Baltimore & Ohio road, at Newark, O., with a clear-story made in sections, so that a portion of it may be repaired without taking off the whole.

THE first road in Ohio was the old Mad River & Lake Erie road, extending from Springfield to Sandusky, afterward known as the Cincinnati, Sandusky & Cleveland, but now as that of the Indiana, Bloomington & Western. The first sod of this line was cut at the end of Water street, Sandusky, September 7, 1835, by General, afterward President Harrison and Governor Vance. The occasion was one of general rejoicing—processions were formed, the air was resonant with music, and the display of bunting was profuse. At the conclusion of the ceremony a grand banquet was held at "Victor's Hotel" (now Townsend House), at which Governor Vance presided. "The Sandusky" was the first engine run on this road, and was the first locomotive in America to which a regular steam whistle was applied. The road then ran through Bellevue to Tiffin, but since then another route has been opened through Clyde, and the old track taken up.

DURING the fiscal year ending June 30, 1882, there were exported from the Unittd States to foreign countries, 2,663 passenger and freight cars, valued at $1,373,059; to the Argentine Republic 30, Brazil 118, Central American States 24, Chili 100, China 1, Germany 8, England 33, West Indies 66, Australia 23, Hawaiian Islands 86, Mexico 838, Peru 6, Spain 10, Cuba 528, U. S. of Colombia 258 and to Canada and British Columbia 534. The number of locomotives exported during the same period was 133, valued at $1,455,717; to Brazil 15, Central America 2, Chili 4, England 1, Canada and British Columbia 40, Australia 10, Hawaiian Islands 1, Mexico 53, Peru 1, Azores 1, and to United States of Colombia 5. The number of car wheels exported for same period was 12,319, valued at $118,195; of which 2,848 went to Brazil, 1,680 to England, 2,202 to Mexico 1,754 to Cuba, 682 to the Argentine Republic, 322 to Belgium, 336 to Chili, 316 to Australia, 440 to Peru, and smaller quantities to Canada and elsewhere.

A STATEMENT that the New York Elevated Railway structures were insecure, through the weakness of the foundation, has brought from Chief Engineer Robert I. Sloan a denial of its truth. Mr. Sloan said:

"The statement is incorrect. The flag-stones on which the iron pillars rest are in good condition; in fact, there has been no settlement of the foundations anywhere, and they are as stable as they ever were. We have a constant street inspection along the line of roads, and eapecially whenever exca vations are made in the vicinity of the supporting pillars for the purpose of laying pipes, constructing sewers, etc. When it was found necessary to use engines weighing from seventeen to twenty-one tons, on the Metropolitan road, the company immediately began to strengthen the structure. We have already strengthened 1,500 floor-beams, which rest on the truss, and bear the main weight of the trains, at an expense of about $105,000. It is with the elevated railroads as it is with all roads. When travel increases heavier engines are put in operation, and then the bridges on the line are strengthened. It was found soon after the Metropolitan was first operated that more metal would be required in the structure. The newer roads north of Central Park and on the east side, were built considerably stronger to meet all the requirements of the Rapid Transit Commissioners. There is a close watch kept of the condition of the elevated roads—such as the deflection of any girders, etc.—and, whenever required, alteration or strengthening work is done. There is no doubt that the elevated structures will last unimpaired for years."

Two combination sleeping and parlor cars have recently been built at the Gilbert & Bush Co.'s shops, at Troy, for shipment to Australia. They are constructed from designs of Mr. G. Leve, of the firm of Leve & Alden, of New York. The cars are each 60 feet in length and have six-wheel trucks. The interior in the daytime appears like a parlor car, and has 20 revolving chairs. At night these chairs disappear and are replaced by berths for 20 persons. The following description of the way the transformation is effected is taken from the *N. Y. Times:* "What look like panels between the windows are in reality shallow closets, four or five inches deep. When the beds are to be made the doors forming these closet-panels are opened, and make the ends of the berth sections. Out of the sides of the narrow closet come two wooden cross-pieces that keep the ends in place. On the inside of each door hangs a folding steel spring, which when opened out, forms the foundation of a comfortable bed. One of these is for the upper berth, the other for the lower. The two mattresses and the blankets hang in the panel closet. In a linen locker at the end of the car are kept the bed linens, the pillows, and the protecting curtains for each section. Out of the upper portion of the closet swings a contrivance for holding the passenger's clothes, which are hung up neatly between the berth and the window. Each of the panel closets is lined with sheet-iron to make it impervious to dampness. Bringing the beds and bedding thus out of the sides of the car, the porter can make up a section in less than a minute, and put everything away again in the same brief time. The bedding is stored in such a way as to be thoroughly ventilated, and no part of it is used for cushions by passengers through the day."

NATIONAL CAR BUILDER

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JAMES GILLET, Editor.
FRANK C. SMITH, M. E., ASSOCIATE EDITOR.

MAY, 1883.

CONTENTS.

EDITORIAL ANNOUNCEMENTS.

Addresses.—*Business letters should be addressed, and drafts and money orders made payable, to* THE NATIONAL CAR-BUILDER. *Communications for the attention of the Editor should be addressed* EDITOR NATIONAL CAR-BUILDER.

Advertisements.—*Nothing will be inserted in this journal for pay,* EXCEPT IN THE ADVERTISING COLUMNS. *The editorial department will contain our own views and opinions; and the rest of the reading matter, aside from advertisements, will be such as we consider of interest to our readers.*

Contributions.—*Articles relating to railway rolling stock construction and management, and kindred topics, by those who are practically acquainted with these subjects, are especially desired. Also early notice of changes in railroad officers, organizations and names of companies.*

Special Notice.—*As the* CAR-BUILDER *is printed and ready for mailing on the last day of the month, advertisements, correspondence, etc., intended for insertion, must be received not later than the 25th day of the month.*

SUBSCRIPTIONS *to the* CAR-BUILDER *will be received, and opies kept for sale, at the following places:*
A. WILLIAMS & CO., 283 *Washington St., Boston, Mass.*
L. SCHAFFNER, *Cigar and News Dealer, Grand Pacific Hotel, Chicago, Ill.*
WILLIE H. GRAY, 306 *Olive Street, St. Louis, Mo.*
ROBERT CLARKE & CO., 65 *West Fourth Street, Cincinnati, Ohio.*

MR. R. M. VAN ARSDALE, the proprietor of the NATIONAL CAR BUILDER, will be in Chicago during the exposition of railway appliances, and will have an office in the exposition buildings.

COMPOUND ENGINES.

In 1769, Watt, in a letter to his friend, Dr. Small, of Birmingham, said:

"I mentioned to you a method of still doubting the effect of the steam, and that tolerably easy, by using the power of steam rushing into a vacuum at present lost. This would do little more than double the effect, but it would too much enlarge the vessels to use it at all. It is peculiarly applicable to wheel engines, * * * for open one of the steam valves and admit steam until one-fourth of the distance between it and the next valve is filled with steam, then shut the valve and the steam will continue to expand and press round the wheel with a diminishing power, ending in one-fourth of its first exertion, etc., etc."

This was the first suggestion of using steam expansively, and this principle was put into use by Watt in 1776, on an engine at Soho, but it was not until 1782 that Watt took out a patent for the same. Soon after the expansive principle had been promulgated by Watt, Hornblower put forth the idea of obtaining the same end by the use of two cylinders of different sizes, by allowing steam to flow from the boiler into the smaller cylinder, which was then permitted to expand into the larger one. Hornblower's cylinders were located side by side, and gave motion to a working-beam with arch heads, and to him is due the credit of originating the first compound engine.

For years there has been a division of opinion as to the merits of the compound engine. When it was first applied to steam vessels its record was bad, and not until the pressure carried reached and exceeded 50 lbs. per square inch was its superiority manifest, and at the present day there is hardly an engineer who does not admit its superior economy. The application of the compound system to locomotives appears to be due to M. Anatole Mallet, who has for several years past applied his designs successfully to French engines. M. Mallet's design consists of the use of cylinders of different sizes in the same location as on an ordinary engine, the high-pressure cylinder exhausting through a system of pipes in the smoke-arch into the low-pressure cylinder on the opposite side. It was predicted that Mallet's engines would prove failures, as the number

of exhausts through the nozzles was reduced one-half, and that, as there might be an inequality of work performed by the cylinders, the engine would have a tendency to run to one side. Neither of these objections was realized, and the latter is absurd and could be true only if the driving wheels were loose on the axles, which of course is not the case.

The principles underlying the superior economy of the compound engine, although still the subject of discussion, appear to have shaped themselves into a mechanical explanation, as theoretically there is no difference in the effect produced by the expansion of steam in one or several cylinders. A correct understanding or knowledge of the condensation of steam in a cylinder is the corner-stone of all improvement made in the economical use of steam, and this is the secret of the superiority of the compound engine. If we suppose steam to be admitted to a cylinder at 100 pounds pressure, the surface of the bore of the cylinder must be heated to a temperature of 332 degrees—the temperature of steam at 100 pounds pressure per square inch. If the steam is cut off at one-fifth of the stroke and expanded through the other four-fifths, the pressure at the end of the stroke should be theoretically 20 pounds. The temperature of steam at 20 pounds is 228.5 degrees, and the surface of the cylinder is therefore reduced to that temperature, or 103.5 degrees less than the temperature of the incoming steam for the next stroke, at the commencement of which the cylinder must be again heated to 332 degrees by robbing the steam of heat to the extent of the loss. As the steam parts with its heat, condensation necessarily occurs, and more steam must enter to make up the deficiency. Thus, at each stroke it will be seen that the cylinder surface undergoes a change of temperature of over 100 degrees. If we now desire to obtain five expansions of steam in a compound engine, it would practically require 2¼ expansions in each cylinder. As before, the steam enters the high-pressure cylinder at 100 pounds per square inch, or 332 degrees, and is expanded 2¼ times, equaling a terminal pressure of 44.4 pounds, at which pressure the temperature is 275 degrees, and the difference is 57 degrees. From the high-pressure cylinder the steam at 44.4 degrees is exhausted into the low-pressure cylinder, where it is again expanded 2¼ times, giving a terminal pressure in that cylinder a little less than 20 pounds, at which pressure the temperature is 228.5 degrees, or a difference of temperature to which the low-pressure cylinder is subjected of 46.5 degrees. It will thus be seen that neither cylinder is subjected to such varying temperatures. It will also be seen that the variation of 57 degrees in the high-pressure and 46.5 degrees in the low-pressure cylinder, when added together, make 1,035, or practically equal to the variation in the single cylinder when expanding steam five times, and thus theoretically there is no difference ; but it has been proven that the condensation in a cylinder is as the square of the difference of the variation of temperature, and the square of 103 is 10,609 and of 46.5 is 2,162.25 and of 57 it is 3,249. Adding the squares of the difference in the compound engine, we have 3,249+2,162.25 = 5,411.25, which is a little over one-half of the square of the difference (10,609) in the single cylinder, from which it may be inferred that the compound engine under the conditions is subjected to but half the condensation of the single-cylinder engine, and to this fact is due its superior economy. The effect of the clearances is neglected in the above.

There are many theories relative to the proper ratio of the areas of the cylinders, and they have been made from equal capacity to a ratio of 1 to 11¼. Probably the most extensively used "rule" by those using a rule is as follows, the object being to have each cylinder perform equal work : Let

a = area of piston in high-press. cylinder.
b = ratio of expansion in high-press. cylinder.
c = area of piston in low-press. cylinder.
Then $c = a\,b$.

As the ratio of expansion should be equal in each cylinder, and the whole ratio of expansion is equal to the initial pressure in the high-pressure cylinder divided by the exhaust pressure in the low-pressure cylinder, we have as the ratio of expansion in each cylinder $\sqrt{\frac{d}{t}}$ where d is the initial pressure in the high-pressure cylinder, and t the terminal or exhaust pressure in the low-pressure cylinder. Taking the data of the case supposed in the first part of this article, where the initial pressure was 100 pounds and the exhaust pressure 20 pounds, and we have $\sqrt{\frac{100}{20}}=2.25$. Therefore the low-pressure cylinder should be 2.25 times the area of the high-pressure cylinder, and it will be seen that the ratio of the areas of the two cylinders (2.25) is also the ratio of expansion in each.

The above, in plain English, is as follows : Ascertain the initial and terminal pressures at which it is intended to work the steam, then divide the initial by the terminal pressure, the quotient equaling the number of times the steam has been expanded. Get the square root of the quotient, and as the root is to the square, so must be the area of the high-pressure to that of the low-pressure cylinder. The ratios of areas of cylinders, or the number of times the low-pressure cylinder is larger in area than the high-pressure one, varies greatly in locomotives in which the compound system has been applied. Webb uses on his 3-cylinder compound engine, two high-pressure cylinders each 11½ in. diameter, both exhausting into a third low-pressure cylinder of 26 in. diameter, making the area of the compound cylinder 2.55 times larger than the two high-pressure cylinders area.

In the Dunbar engine, illustrated in the April CAR-BUILDER, the low-pressure cylinders are 2.78 times larger than the high-pressure cylinders. Mallet has used a variety of ratios, as 2.78, 2.53, 2.56, 2.25, 1.71, 1.86, etc., etc., with boiler pressures of 140, 170, 120 and 100 pounds per square inch. Webb, by means of his compound, reduced the fuel consumption from 30 to 22 lbs. per mile, while Mallet, with a compound engine with the high-pressure cylinder of 9.45 diameter and the low-pressure cylinder of 15.75 diameter (ratio 1 to 2.78), with a boiler pressure of 150 lbs. per square inch, reduced the consumption of fuel per horse-power per hour from 5½ pounds for an ordinary engine to 3.3 for his compound.

When a high and low pressure cylinder are each connected to separate cranks at quarters, the necessity for a receiver or receptacle into which the steam from the high-pressure cylinder is first exhausted, is necessary to equalize the pressure of the steam drawn from it by the low-pressure cylinder. In Dunbar's arrangement, this necessity does not exist, as the pistons move together from end to end of the cylinders. In Dunbar's arrangement, when cutting off at ¼ or ⅛, the exhaust will open soon after half stroke, but as the low-pressure cylinder can not take the exhaust steam at this time, the expansion line of the high-pressure cylinder will be maintained to a great extent until near the end of the stroke, decreasing only by the expansion due to the clearance between the two cylinders. which is small. As the two valves have equal lap and lead, the low-pressure cylinder will commence taking the exhaust steam from the high-pressure cylinder at the same instant the high-pressure cylinder takes steam, and in fast-running engines it will probably be found necessary to use less lap on the low-pressure valve, in order to allow the exhaust from the high-pressure cylinder to clear in advance of its taking steam for the next stroke.

There is another advantage of the compound system when applied to large engines using high grades of expansion, and that is the less liability of the crank-pin to heat from the sudden inflow of high-pressure steam.

FIRE-PROOF PASSENGER CARS.

The *New York Herald* says that there is no good reason why all passenger cars on steam roads should not be thoroughly fire-proof, and that it is high time that a new departure in this respect should be taken, as it seems easy and entirely practicable to construct passenger cars of metal or other incombustible material.

By way of comment on the above, it may be said that the traveling public will be provided with fire-proof cars at some future time, perhaps, but not until there is a more urgent demand for them than exists at present. Just now, the demand is light, because the great mass of people are very well satisfied with what they have, or would be, if cars were a trifle more luxurious, stylish and exquisite than they are. The vast majority of travelers will take the chances when they journey in winter, rather than dispense with the hot stoves to which they have been so long accustomed ; and as for as any new-fangled incombustible wood finish, they will continue to prefer the elegant cabinet work and gilded and varnished surfaces to any thing plainer and safer.

Metallic car bodies are no new idea. They have been built of iron tubes and steel rods framed together, with an outside covering of sheet iron, and have done fair service as freight cars. It has been proposed to construct passenger cars on the same plan, the inside finish being wood, of course; but we are not aware that any such cars have yet been built and put in service. There is evidently but one way to make a fire-proof car or a fire-proof building, and that is to construct it throughout of materials that will not burn under any circumstances. The best of the so-called fire-proof buildings are not entirely so. They always contain some wood-work as well as furniture and other property, more or less, that will readily take fire, and the same may be said with respect to railway passenger cars. The framing and floors may be made of metal and the outside paneling of iron or of wood well covered with metallic fire-proof paint. The inside can also be of sheet metal or of wood saturated with chemical ingredients that are said to render it incombustible, or nearly so. The seat frames also can be made of iron, and the cushions and backs with the least possible upholstering necessary for the comfort of the sitter. But would such cars be pleasant to ride in? Would the great traveling public, after being pampered so excessively during all these years with luxurious and palatial finery in car decoration, be willing to dispense with mahogany, rosewood and varnish (all of which will ignite about as quickly as petroleum) for plain surfaces of fire-proof paint, just for the satisfaction of knowing that however cruelly they might be transfixed or crushed in a collision by fragments of iron or incombustible wood, they would not be burned alive or cremated? Some people, doubtless, would be willing to do so, but the great majority would not. The mass of people would, and do, prefer to take the chances, just as they do when they put up at six story tinder-box hotels, feeling in all their bones that after *us* comes the midnight conflagration with its horrors unspeakable.

When the demand for safety, as against fire, in railway cars, shall become so pressing and universal as to make some effective provision for it indispensable, it will probably be found that there is another way of cornering the problem without resorting to the difficult and even questionable expedient of making cars fire-proof, and that is, not to carry any fire in them. This would not, of course, prevent the burning of cars from outside contact with fire, but it would prevent conflagrations from originating inside —a class of accidents which are the most to be dreaded, and which have hitherto in our railway history been fearfully destructive of human life. The warming of cars with steam or hot water, conveyed from the locomotive or supplied by a special apparatus in baggage cars, is barely practicable, perhaps; but thus far the unsuccessful efforts of inventors to devise a good practicable working plan is an evidence of the difficulties which lie in the way of the general adoption of these methods.

COMMITTEES AND COMMITTEE CIRCULARS.

We print on another page a few circulars that have recently been sent out by committees of the Car-Builders' Association to obtain information to be used in preparing reports to be made to the annual convention next month. These circulars are somewhat different in their tenor and wording from the majority of those issued in former years, but whether they will prove more effective in eliciting the kind of information that is wanted, remains to be seen. Most of the old style of circulars, as will be remembered, contained a string of questions covering the leading points involved in the respective subjects upon which the committees were expected to report. These questions were regularly numbered, and one or two blank lines were left between them upon which the replies were to be written, many of the questions being so framed as to admit of being answered with a "yes" or "no," or a "we do" or "we don't." This was a sort of labor-saving method designed to make it easy for those who were expected to furnish the needed information, but it can not be said that the method was a very great success. The number of circulars that were returned to the committees with the blank lines filled in was very small, as compared with the whole number issued. The committee reports from year to year, were, as a rule, but little more than a recapitulation or summary of the questions and replies. The information or raw material obtained in this way, scanty as it was, was usually incorporated into the reports without much analysis or any very careful deductions or conclusions therefrom, leaving the convention to get at the gist of the matter as best it could. We are glad to see that the circulars sent out this year do not contain so many questions. The respondents are not put so decidedly on the witness stand as formerly, but are allowed a larger discretion in the framing of their answers.

We need not urge the importance of furnishing the committees with the information asked for. In an organization like that of the Car-Builders' Association, the functions of committees ought by this time to be pretty well understood, especially by those who constitute the old membership. These committees are the working-power of the association, its very life, in fact. Their reports are the basis of action for the collective body, and the labor and research bestowed upon them are the measure of their value. If there should be a little extra labor put upon them it will be all the better, because in the long run it is the *extra* labor which tells. A committee composed of three or four members who have a practical knowledge of car construction, can easily prepare an interesting report upon any special feature of such construction by giving the conclusions reached from their own experience ; but it would be a great assistance if they were well informed in regard to the views of other car-builders, and of any peculiarities in the practice of roads not represented in the committee. If this assistance is withheld, or only furnished in homeopathic driblets, the committee is embarrassed in its labors, and unless the members of it have a pretty good fund of information of their own to draw upon, its report is pretty sure to be meager and unsatisfactory. As we have said in previous articles, the success of the new departure taken by the association will depend upon the character of the reports of committees made at the annual conventions ; and we will venture to say now, that good and valuable reports will depend very much more upon the individual members of committees than on the information obtained by circulars, unless this method shall prove to be more effective in the future than it has been in the past.

One of the objects, if it were not, indeed, the main object of the reorganization of the association last fall, was to lift it out of old ruts. One of these ruts was the indefinite continuance of committees on the same subjects—new committees being appointed when old ones were tired of being "continued another year," when there was no reasonable probability that the next year's report would differ essentially from that of the previous year except in its date. In order to bring about any marked improvement the committees will have to rely more on their own resources in preparing their reports than has hitherto been the case. Every practical car-builder is presumed to have some well-

considered opinions of his own in regard to all essential features of construction, and when three or four persons of this sort confer together as a committee, there is no reason why their combined experience should not enable them to make a good report, even if they have not sent out a circular, or received a single reply to any that have been sent. This, of course, can not be done at one or two brief meetings, or by exchanging a few letters, nor can it be done by a meeting of the members of the committee at a hotel a few hours before the report is called for in convention. Another obstacle in the way of good reports heretofore has been the reluctance of members to commit themselves in black and white in regard to the intrinsic merits of particular inventions and devices, lest they should advertise somebody's wares, or compromise their reputation as mechanics, or incur the displeasure of their "superior officers." Now that the association has become a representative one in fact, it is to be hoped, as well as in name, its members will be subjected to this kind of restraint in a less degree than they have been heretofore. It may have been less in the past than we suppose, but that it has had some influence in determining the character of committee reports is quite obvious.

THE NATIONAL RAILWAY EXPOSITION.

The great National Exposition of Railway Appliances at Chicago will be opened May 24. The magnitude of the enterprise increases from day to day, and the indications are that when the time arrives the arrangements in every detail will be as complete as it is possible to make them. In order to accommodate exhibitors who have already applied for space, the floor capacity of the buildings has been increased 300,000 feet. A special notice has also been issued requiring all allotments of space to be occupied on or before the opening day, so there will be no confusion or delay, or disappointment to the multitude of visitors who will be present to witness the formalities of the occasion.

The tests that are to be made of the strength and quality of materials will be one of the most important features of the exhibition. The committee who have this matter in charge includes some of the most capable members of the engineering profession, and in order that such tests may be as thorough and as complete as possible, it is requested that visiting engineers bring with them any substances or materials suitable for testing, and also aid the committee with such suggestions as may be calculated to promote the efficiency of the tests.

It would require far more column space than we have at command to set forth a tithe of the attractions that await the visitors to the exposition. It is safe to say that the display of materials, inventions, constructive designs, and whatever illustrates railway progress and the growth of innumerable collateral industries in this country, will be upon a scale that has hitherto been unsurpassed, and may not be repeated for many years to come. One of the unique features will be the "Old Curiosity Shop," consisting of rude and simple appliances and relics of early construction, contrasted as they will be with the modern achievements of mechanical science. This feature alone will be attractive to thousands of people, and will leave upon their minds a lasting impression; and the exhibition as a whole will have the effect of educating the great mass of our people to a truer appreciation of railways in their relations with the business interests and general prosperity of the country.

THE Asphaltum Paints, manufactured by the National Paint Works, at Williamsport, Pa., are composed of the best leads, zincs, minerals and proportions of crude asphaltum, with the standard coloring material ground in and thinned with linseed oil. These paints are being extensively used for freight cars-freight depots and railway bridges, and give good satisfaction. They are used by the Pennsylvania road for freight car painting and by the New York, West Shore & Buffalo for bridge painting, and are used more or less by a large number of other roads.

MRS. LILLIE DEVEREUX BLAKE has prepared for publication her recent lectures in reply to the Rev. Dr. Morgan Dix. They will be immediately issued under the title of "Woman's Place To-day," in 1 vol., 12mo, cloth; and also as a 20 cent number of "Lovell's Library," by John W. Lovell Co., New York.

HENRY R. WORTHINGTON, manufacturer of pumps, has removed to his new offices and warerooms at 86 and 88 Liberty street, and 145 Broadway. N. Y.

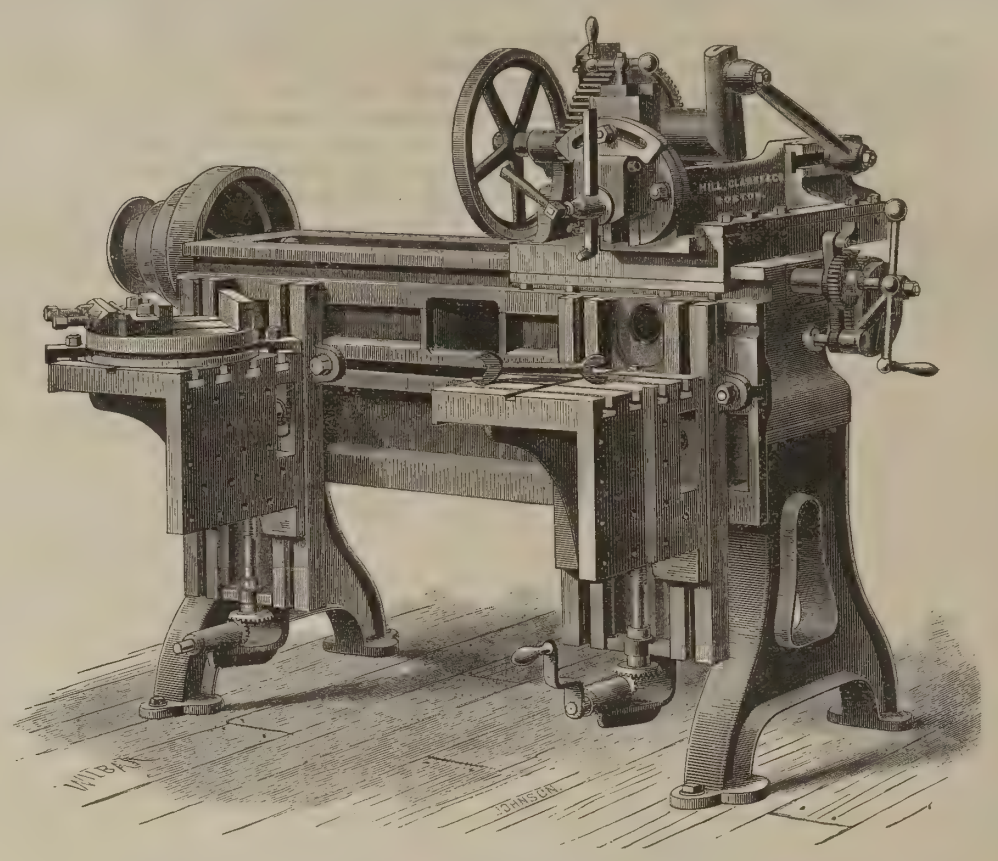
Employment.

Advertisements will be inserted under this heading for one dollar for each insertion.

WANTED.—By a first-class mechanical draughtsman (age 27) who is thoroughly familiar with all kinds of car work, a permanent position either in office or in superintending car construction. Railroad company's office preferred. Best of references can be furnished. Address "Gondola," office of NATIONAL CAR BUILDER. 2t.

WANTED.—A situation by a man who has had 25 years' experience on Locomotive repairs—the last 12 years as Master Mechanic and Master Car-Builder on two roads, one in the Eastern States and one at the West. Can give satisfactory references Address "H. W. C.," office of NATIONAL CAR-BUILDER.

WANTED.—A position as foreman in the car department of a railroad repair shop. Can give the best of references from former employers. Address C. S., office of NATIONAL CAR-BUILDER.



WARREN'S IMPROVED 12-INCH STROKE SHAPING MACHINE.

THIS machine has a balance wheel running at high speed, independent of the cone shaft, in a convenient position, to be used in adjusting the tool to any desired point or line, and is speeded 8 revolutions to one stroke. It can be detached, if desired, or used to operate the machine by hand, by inserting a handle. A long shaft can be slotted on this machine by bringing the table under an open space in the base. It has a movable apron for holding irregular work, which is always in position. The cutter-bar is driven by a variable quick return; it has a bearing 27 inches long, 8½ wide; square gibs, and possesses all the advantages of a draw stroke drawing from center of bar. The connection rod is wrought-iron, with hardened steel bushings and thimbles. The table is raised and lowered by crank and bevel gears so proportioned as to work it quickly and easily. The head traverses 24 inches, and is also provided with square gibs in front. All slides are scraped fits, bearings large and long. A rotary arbor with a pair of cones for circular work is furnished, and can be attached or detached in an instant. A strong and convenient chuck, also a pair of improved centers can be furnished with machine if ordered. Countershaft and wrenches included with machine. Manufactured by Hill, Clarke & Co., Boston, Mass., and St. Louis, Mo.

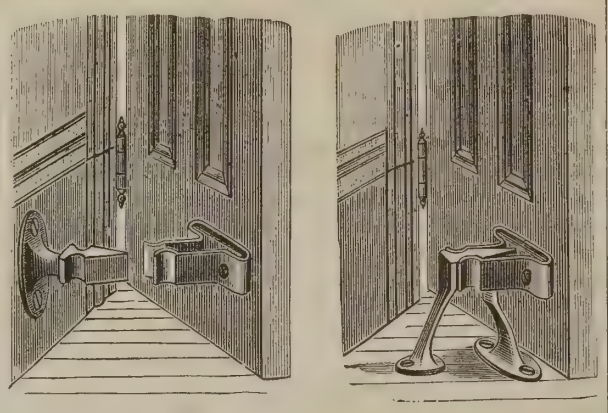


Fig. 1. Fig. 2.

Door Check and Wall Protector.

This simple and ingenious device is a self-adjusting door-holder and wall-protector, which can be applied not only to car doors but to the heaviest doors of buildings. It consists of metallic attachments made of brass, the forms of which are shown in the cuts. Fig. 1 shows the wall and door attachments disengaged, the former having a wedge-shaped point which is forced between the two projecting springs of the latter when the door is thrown open, in which position the door is held until it is desirable to close it. Fig. 2 shows the floor attachments, and the position of the parts when the door is held open, the tension of the springs being regulated by a turn of the screws so as to make the device adjustable to the size and weight of the door. The durability of the material prevents the device from getting out of order. It is easily attached to wall or floor, and can be put in position in a few minutes, and is to be used on all the cars of the Wagner Sleeping Car Company. Patented by the Pullman Door Check Co., Chicago, Ill. W. S. Brewster, Agent, 246 South Clark Street, Chicago.

Our Directory.

We note the following changes since our last issue:

Baltimore & Ohio.—John Thomas, Superintendent of Chicago Division, has resigned.

Boston, Concord & Montreal.—J. A. Dodge has resigned as General Manager. W. A. Stowell has been appointed General Superintendent, and George W. Storer Purchasing Agent.

Boston & Lowell.—C. S. Mellen has been appointed Superintendent.

Chicago, Rock Island & Pacific.—The office of General Manager has been changed from Davenport, Ia., to Chicago. H. F. Royce has been appointed Assistant General Superintendent.

Cincinnati, Washington & Baltimore.—This newly organized company has taken possession of the Marietta & Cincinnati road, the old officers of which are continued.

Cleveland, Youngstown & Pittsburg.—W. E. Lewis has resigned as General Superintendent, to except same position on the Mexican National Railway.

Delaware Western.—The name of this road has been changed to "Baltimore & Philadelphia," of which S. Spencer is General Manager and D. Connell is Superintendent.

Illinois Central.—M. Gilleas, Road Master of the Iowa Division, is appointed Acting Superintendent, with office at Dubuque, Ia., during the absence of D. W. Parker.

Louisville & Nashville.—L. Hege has been appointed Superintendent of Henderson Division, with office at Henderson, Ky.

Morgan's Louisiana & Texas.—George Pandely has resigned the position of Superintendent. He has been connected with the road in this capacity for many years.

Ohio & Mississippi.—The office of J. H. Setchel, Master Mechanic, has been removed from Vincennes, Ind., to Cincinnati, O.

New York, Chicago & St. Louis.—A. H. Evans has been appointed Acting Superintendent of the Western Division in place of E. E. Dwight, who has gone to the Toledo, Cincinnati & St. Louis.

New York, Lake Erie & Western.—I. Jolls has been appointed Superintendent of the Susquehanna Division in place of Mr. R. B. Cable, who has gone to the Denver & Rio Grande road.

New York & New England.—W. G. Tabor is appointed Master Mechanic of the Eastern Division in place of C. B. Moore, resigned.

St. Paul, Minneapolis & Manitoba.—S. R. Stimson has resigned as General Superintendent, the duties of the position having been assumed by the General Manager.

San Francisco & North Pacific.—Edw. Reynolds has been appointed General Master Mechanic, with office at Donahue, Cal.

Toledo, Cincinnati & St. Louis.—E. E. Dwight, recently of the New York, Chicago & St. Louis, has been appointed General Manager, vice T. A. Phillips, resigned. F. W. Stewart has been appointed Purchasing Agent, vice J. H. F. Wiers, resigned.

Union Pacific.—John Wilson is appointed Superintendent of Motive Power and Cars, with office at Omaha, Neb., in place of John McKenzie, resigned.

United States Rolling Stock Co.—Mr. C. Benn has been elected Treasurer and Secretary, vice D. M. Monjo, resigned.

Wabash, St. Louis & Pacific.—R. B. Lyle has been appointed Purchasing Agent, vice W. S. Lincoln.

DIRECTORY

of the Railroads of the United States and Canada, showing the gauge, length of road, number of locomotives and number of cars; and giving the names and titles of their principal officers in charge of the operating, purchasing and rolling stock departments.

A

Adirondack R. R. 4-8½ gauge 60 m. 3 lo. 62 cars)
C. E. Durkee, *Supt*............Saratoga, N. Y.
Jacob Myers, *M. M*..........Saratoga, N. Y.
Jas. J. Traver, *M. C. B*.........Saratoga, N. Y.
Alabama Great So'n R. R. (*See Cin., N. O. & T. P.*.
Albany & Susquehanna R. R. (*See D. & H. Canal Co.*)
Albert Ry. 4-8½ g. 51 m. 3 lo. 32 cars.
G. A. Robinson, *Manager*.... Hillsboro, N. B.
Jas. McKay, *M. M. & C. B*......Hillsboro, N. B.
Allegany Central R. R. 3 gauge 30 miles.
Geo. D. Chapman, *Gen. Man*...Angelica, N. Y.
W. O. Chapman, *Gen. Supt*...Friendship, N. Y.
Allegheny Valley R. R. 4-9 g. 259 m. 70 lo. 2200 c.
David McCargo, *Gen. Supt. & Pur. Agt.*; and
C. B. Price, *Supt.* (Riv. Div.).....Pittsburg, Pa.
A. A. Jackson, *Supt.*(L.G.Div.).Reynoldsville, Pa.
Geo. W. Glass, *M. M*...............Verona, Pa.
R. Gunning, *M. C. B*.......... Verona, Pa.
Annapolis & Elk Ridge R. R. 4-8½ g. 20 m. 4 lo. 29 c.
W. H. Bians, *Supt. & Pur. Agt*..Annapolis, Md.
John L. Beall, *M. Mach*.........Annapolis, Md.
Arkansas Midland R. R. 3-6 g. 48 m. 4 lo. 45 cars.
A. H. Johnson, *Pr. & Gen. Man*...Helena, Ark.
J. B. Johnson, *M. M. & M. C. B*...Helena, Ark.
Ashland Coal & Iron Ry. 4-8½ g. 30 m. 7 lo. 425 c
Douglas Putnam, Jr., *Gen. Supt*..Ashland, Ky.
Robt. Peebles, *Pur. Agt*..........Ashland, Ky.
E. M. Roberts, *M. M*......... ....Ashland, Ky.
Ashtabula & Pittsburgh Ry. (*See Penna. Co.*)
Asheville & Spartanburg R. R. 5 g. 49 m. 2 lo. 12 c.
Jas. Anderson, *Supt. & Pur. Agt*..Spart'b'g, S.C.
Wm. Platt, *M. M*.............Spartanburg, S. C.
W. B. Brown, *M. C. B*........Spartanburg, S. C.
Atchison, Topeka & Santa Fé R. R.
4-8½ g. 1,900 m. 347 lo. 9,607 cars.
C. C. Wheeler, *Gen. Man*..........Topeka, Kan.
D. J. Chase, *Gen. Supt*............Topeka, Kan.
W. W. Allen, *Asst. Supt*..........Topeka, Kan.
F. M. Smith, *Pur. Agt* .... Topeka, Kan.
Geo. Hackney, *Supt. Lo. & Car. Dept* do.
Clem. Hackney, *Asst.Sup.L. & C. Dept*.do.
Eastern Div.: C. M. Rathbun, *Supt*..Topeka, Kan
Henry Hull, *G. F. Car Dept*.....Topeka, Kan.
John Fagan, *M. M*..............Atchison, Kan.
J. M. Smith, *M. M*......... .Kansas City, Mo.
Alfred Taylor, *M. M*............Emporia, Kan.
Mid. Div.: H. R. Nickerson, *Supt*.Nickerson, Kan.
W. Y. Johnson, *M. M*........ .Nickerson, Kan.
J. Q. Adams, *M. M*...............Dodge, Kan.
Col. Div.: W. W. Borst, *Supt*........La Junta, Col.
A. C. Stiles, *M. M*........... La Junta, Col.
D. H. Dotterer, *M. M*.. ....Raton, N. M.
Las Vegas D.: Geo. L. Sands, *Supt*.Las Vegas, N.M.
L. H. Waugh, *M. M*.........Las Vegas, N. M.
Rio G. Div.: Geo. L. Sands, *Supt*. Las Vegas, N.M.
J. H. Holman, *M. M*. ....Wallace, N. M.
J. W. Sager, *M. M*.........San Marcial, N. M.
H. P. Olcott, *M. M*..... . .....Deming, N. M.
Atlanta & West Point R. R. (*See Western of Ala.*)
Atlantic & Pacific R. R. 4-8½ g. 286 m.
F. W. Smith *Gen. Supt*.....Albuquerque, N. M.
Geo. Chalender, *Div. Supt*..Albuquerque, N. M.
D. Hardy, *Div. Supt*..... . ...Williams, Ar.
Geo. Chalender, *Supt. M. P. & M*.. do.
D. B. Sibley, *Pur. Agt*..............Chicago, Ill.
Augusta & Knoxville R. R. 30 miles.
Gen. Supt & M. M..Augusta Ga.

B

Baltimore & Ohio R. R.
4-8½ g. 1,539 m. 546 lo. 14,862 cars.
N. S. Hill, *Pur. Agt*...... ......Baltimore, Md.
E. Ohio Riv. Div. 4-8½ g. 972 m.
W. M. Clements, *Mast. Trans*...Baltimore, Md.
N. E. Chapman, *Mast. of Mach*..Baltimore, Md.
A. J. Cromwell, *Asst. M. of M* ..Baltimore, Md.
L. Packard, *M. C. B*... . ...Baltimore, Md.
I. N. Kalbaugh, *M. M*..........Baltimore, Md.
Wm. Edwards, *M. M*..Martinsburgh, W. Va.
Sam. Houston, *M. M*........Piedmont, W. Va.
Robert Maxwell, *M. M*.......Cumberland, Md.
S. B. Crawford, *M. M*.. ......Grafton, W. Va.
Alex. Laird, *M. M*.......Parkersburg, W. Va.
Chas. Hirsch, *M. M*... .....Wheeling, W. Va.
Pitts. Div.: T. M. King, *Gen. Supt*...Pittsburg, Pa
J. E. Sampsell, *Asst. M. of M*.Connelsville, Pa.
Trans-Ohio Divs.: B. Dunham, *G. Man*...Newark, O.
W. H. Harrison, *Asst. M. of Mach*..Newark, O.
E. L. Weisgerber, *M. M*....... ....Newark, O.
H. M. Ingler, *M. M*.. ....Bellaire, O.
O. B. Perkins, *M. M*............Zanesville, O.
Andrew Beckert, *M. M*..........Sandusky, O.
F. J. Gunther, *M. M*.....Chicago Junction, O.
Chi. Div.: *Gen. Supt* ...Chicago, Ill.
Benj. Lowther, *M. M*.... .... Garrett, Ind.
W. H. Wilkinson, *M. M* ... .. Kingston, Ill.
Baltimore & Philadelphia. 4-8½ g. 20 m. 4 lo. 35 c.
D. Connell, *Supt* ....Wilmington, Del.
Baltimore & Potomac R. R. (*See Penna. R. R.*)
Bangor & Piscataquis R. R. 4-8½ g. 63 m. 4 lo. 87 cars.
Arthur Brown, *Supt*. ....Bangor, Me.
C. S. Nason, *M. M* ....Bangor, Me.
J. W. Comins, *M. C. B*... .. ..Oldtown, Me.
Barclay R. R. 4-8½ g. 16 miles.
F. F. Lyon, *Supt*......... ....Barclay, Pa.
J. A. Hardenburg, *Pur. Agt*..21 Cort. st, N. Y.
Wm. Johnson, *M. M*...............Towanda, Pa.
Bedford, Springville, Owensburg & Bloomfield Ry.
3 g. 41 m. 5 lo. 65 cars.
Jas. W. Kennedy, *Gen. Supt. & Pur. Agt.*; and
Capt. Geo. Elliott, *M. M*...........Bedford, Ind.
Richard G. Elliott, *M. C. B*.......Bedford, Ind.
Bellaire, Zanesville & Cin. Ry. Co. 3 g. 42 m. 3 lo. 29 c.
S. J. Cochran, *Mast. Trans* ....Bellaire, O.
Bell's Gap R. R. 3 g. 23 m. 4 lo. 130 cars.
R. G. Ford, *Supt*..... .. .Bellwood (P. O.), Pa.
A. Zimmerman, *M. C. B*..........Bellwood, Pa.
Bennington & Rutland Ry. 4-8½ g. 9 m. 10 lo. 214 c.
F. C. White, *Supt. & Pur. Agt*..Bennington, Vt.
G. W. Blanchard, *M. M*.............Rutland, Vt.
Bingham, Canyon & Camp Floyd, and
Wasatch & Jordan Valley R. R.'s.
3 g. 44 m. 7 lo. 300 cars.
J. G. Kennedy, *Gen. Man*..Salt Lake City, Utah
Geo. M. Young, *Supt*...... do. do.
Bodie Lumber Co. 3 g. 34 miles.
Thomas Holt, *Supt. & Pur. Agt*.....Bodie, Cal
E. M. Luckett, *M. M. & C. B*........Bodie, Cal.
Boston, Barre & Gardner. 4-8½ g. 36 m. 7 lo. 107 c.
H. M. Witter, *Supt. & Pur. Agt*.Worcester, Mass.
Chas. F. Brigham, *M. M* ......Worcester, Mass.
Boston Concord, Montreal & White Mts. R. R.
4-8½ g. 167 m. 34 lo. 677 cars
W. A. Stowell, *Supt*.... .Lake Village, N. H.
Geo. W. Storer, *Pur. Agt*..........Boston, Mass.
R. Adams, *M. M*..... .. ...Lake Village, N. H.
G. A. Ferguson, *Asst. M. M*...Lake Village, N. H.
L. D. Pickering, *M. C. B*....Lake Village, N. H.
Boston, Hoosac Tunnel & W'n Ry.
4-8½ g. 65 m. 18 lo. 1,038 cars.
H. L. Morrill, *Gen. Man*.......Saratoga, N. Y.
C. H. Cory, *Supt* ....Mechanicville, N. Y.
J. H. Wilder, *Pur. Agt*.....Mechanicville, N. Y.
C. H. Corey, *M. M* .. ..Mechanicville, N. Y.
John S. Ellis, *M. C. B*......Mechanicville, N. Y.
Boston, Revere Beach & Lynn R. R. 3 g. 9 m. 5 lo. 46 c.
L. C. Legro, *M. of Trans*...... ...Boston, Mass.
C. A. Hammond, *Supt. & P. Agt*.Boston, Mass.
J. L. Folsom, *M. M*..... ....Boston, Mass.
John Coghlan, *M. C. B*...... ....Boston, Mass.
Boston & Albany R. R. 4-8½ g. 372 m. 245 lo. 6,111 c.
W. H. Barnes, *Gen. Supt*... ....Boston, Mass.
E. Gallup, *Asst. Supt*.........Springfield, Mass.
A. B. Underhill, *Supt. M. P*...Springfield, Mass.
F. D. Adams, *Gen. M. C. B*.......Allston, Mass.
H. B. Chesley, *Div. Supt*.... . ..Boston, Mass.
G. H. Colby, *Div. M. M* ....Boston, Mass.
C. E. Grover, *Div. Supt*....Springfield, Mass.
H. W. Eddy, *Div. M. M*....Springfield, Mass.
J. B. Weston, *For. Car Sh*.Springfield, Mass.
W. H. Russell, Jr., *Div. Supt*.E. Albany, N.Y.
T. B. Purvis, *Div. M. M*...East Albany, N. Y.
J. E. Doran, *For. Car Sh*..East Albany, N. Y.
Boston & Lowell R. R.
4-8½ g. 140 m. 73 lo. 1,231 cars.
C. H. Mellen, *Supt*................Boston, Mass.
F. H. Nourse, *Pur. Agt*.... ......Boston, Mass.
J. F. Crockett, *Supt. T. & Mach*..Boston, Mass.
Boston & Maine R. R. 4-8½ g. 206 m. 89 lo. 2,100 c.
J. T. Furber, *Gen. Supt. & P. A*..Boston, Mass.
Geo. J. Fisher, *Pur. Agt*..........Boston, Mass.
Wm. Smith, *M. M*..... ....Boston, Mass.
D. C. Richardson, *M. C. B*.....Lawrence, Mass.
Boston & Providence R.R. 4-8½ g. 67 m. 52 lo. 1,006 c.
A. A. Folsom, *Gen. Supt*.........Boston, Mass.
Geo. Richards, *M. M*...........Roxbury, Mass.
Jno. Lightner, *M. C. B*........ .Roxbury, Mass.
Bradford, Bordell & Kinzua R. R. 3 g. 30 m. 6 lo. 80 c.
R. G. Taylor, *Gen. Man*..........Bradford, Pa.
John Delaney, *M. M. & C. B* ...Bradford, Pa.
Bradford, Eldred & Cuba R.R. (*See Tonawanda, etc.*)
Breakwater & Frankford R. R. (*See Junc. & Break.*)
Brighthope Ry. 3 g. 37 m. 3 lo. 193 cars.
Jas. R. Worth, *Supt*.... ......Richmond, Va.
A. Gary, *Supt. Way & Works*.Winterpock, Va.
Alex. Calder, *M. M*........ ....Chester, Va.
Brunswick & Western R. R. 5 g. 172 m. 13 lo. 170 c.
R. D. Meader, *Supt*.. .. ..Brunswick, Ga.
Buff., N.Y. & Phila. Ry. 3 & 4-8½ g. 242 m. 48 lo. 3,500 c.
Geo. S. Gatchell, *Gen. Supt*......Buffalo, N. Y.
W. W. Halsey, *Asst. to G. Supt*..Buffalo, N. Y.
J. H. Poole, *Pur. Agt*...........Buffalo, N. Y.
Allen Vail, *Supt. M. P. & M*.....Buffalo, N. Y.
Buff. Div.: J. T. Gardiner, *Supt*....Buffalo, N. Y.
Roch. Div.: R. M. Patterson, *Supt*.Rochester, N.Y.
N. G. Div.: J. W. Watson, *Supt*......Olean, N. Y.
Riv. Div.: A Vandivort, *Supt*.....Buffalo, N. Y.
Pitts. Div.: E. H. Witter, *Supt*... .Pittsburg, Pa.
Buff., Pittsburg & W'n R. R. 4-8½ g. 156 m. 33 l. 975 c.
O. Watson, *Gen. Supt. & Pur. Agt*.Buffalo, N. Y.
E. H. Witter, *Asst. Supt*..... .....Oil City, Pa.
H. J. Bookhammer, *M. M*.........Oil City, Pa.
John Monks, *M. C. B*.. .. ..Oil City, Pa.
Burlington, Cedar Rapids & Northern Ry.
4-8½ g. 713 m. 73 lo. 2,738 cars.
C. J. Ives, *Gen. Supt*. ....Cedar Rapids, Ia.
Robt. Williams, *Supt* ....Cedar Rapids, Ia.
T. Stickney, *Pur. Agt*...... ...Cedar Rapids, Ia.
R. W. Bushnell, *M. M. & C. B*.Cedar Rapids, Ia.
Burlington & Lamoille R. R. 4-8½ g. 35 m. 4 lo. 64 c.
G. L. Linsley, *Gen. Man. & Supt*.Burlington, Vt.
F. G. Brownell, *M. M., M. C. B. & P. A.* do.
Burlington & Mo. Riv. R. R. (in Neb.) (*See C. B & Q.*)
Burlington & North-West'n Ry. 3 g. 38 m. 3 lo. 85 c.
John T. Gerry, *Supt*.............Burlington, Ia.
Burlington & Ohio River R. R.
Gen. Man. & Pur. Agt.Chicago, Ill.
J. K. Lape, *Supt. of Equip*.........Chicago, Ill.

C

California Southern R. R. 4-8½ g. 127 m. 13 lo. 301 c.
J. N. Victor, *Supt*...........National City, Cal.
Berkley Powell, *Mech. Supt*..National City, Cal.
Camden & Atlantic R. R. 4-8½ g. 79 m. 16 lo. 264 c.
J. T. Bannard, *Supt & Pur. Agt*.Camden, N. J.
Rufus Hill, *M. M*.. ....Camden, N. J.
Samuel Wills, *M. C. B* ....Camden, N. J.
Canada Southern Ry. 4-8½ g. 403 m. 89 l. 3,367 c.
W. P. Taylor, *Gen. Man*.... .....Buffalo, N. Y.
A. F. Howland, *Pur. Agt*......St. Thomas, Ont.
Rob't Potts, *Gen. M. C. B*......St. Thomas, Ont.
Can. Div.: E. P. Murray, *Supt*..St. Thomas, Ont.
Robert Potts, *M. C. B*.......St. Thomas, Ont.
U. S. Div.: E. P. Murray, *Supt*. ....Detroit, Mich.
O. P. Dunbar, *M. M*...... Grosse Isle, Mich.
Canadian Pacific R. R. 4-8½ g. 551 m. 26 lo. 473 c.
W. C. Van Horne, *Gen. Man*...Winnipeg, Man.
Eastern Div. 240 m. 16 lo. 276 cars.
Archer Baker, *Gen. Supt*......Montreal, Can.
Tho. Irwin, *Mech. Supt*.......Brockville, Ont.
Western Div. 311 m. 10 lo. 207 cars.
A. B Stickney, *Gen. Supt*....Winnipeg, Man.
T. W. Shaughnessy, *Pur. Agt*.Winnipeg, Man.
F. C. Butterfield, *M. M. & M. C. B*.Winnipeg, Man.
Cape F'r & Yadkin Val. R. R. 4-8½ g. 47 m. 3 lo. 31 c.
L. C. Jones, *Gen. Supt*.......Fayetteville, N. C.
Isaac W. Clark, *M. M. & C. B*..Fayetteville, N. C.
Carolina Central R. R. (*See Ral. & Aug.*)
Carson & Colorado R. R. (*See Va. & Truckee*).
Catasauqua & Fogelsville. 4-8½ g. 25 m. 6 lo. 577 c.
C. W. Chapman, *Supt. & P. A*.Catasauqua, Pa.
J. Thomas, *M. M*.... .. ...Hokendauqua, Pa.
Chas. J. Holbach, *M. C. B*.....Catasauqua, Pa.
Central and South-Western Railroads (Ga.).
5 g. 975 m. 127 lo. 1,858 cars.
W. G. Raoul, *Pres*...... ....Savannah, Ga.
Wm. Rogers, *Gen. Supt*..........Savannah, Ga.
C. H. Carson, *Pur. Agt*.... ......Savannah, Ga.
Cen. Div.: D. D. Arden, *M. M*......Savannah, Ga.
John McCann, *M. M*... ....Augusta, Ga.
F. Devine, *For. C. Sh*..... ....Savannah, Ga.
So.-West'n Div.: W. F. Shellman, *Supt*.Macon, Ga.
D. M. Gugel, *M. M*................Macon, Ga.
James A. Knight, *M. C. B*....... Macon, Ga.
Central R. R. of N. J. 4-8½ g. 544 m. 294 lo. 27,198 c.
W. W. Stearns, *Gen. Supt*..... Elizabeth, N. J.
B. W. Burnett, *Pur. Agt* ......New York, N. Y.
Cen Div.: W. Woodcock, *M. M*.Elizabethport, N. J.
Geo. Hackett, *M. C. B*. ....Elizabethport, N. J.
C. G. Williams, *M. M*.........Jersey City, N. J.
John Alpaugh, *M. M*.........Phillipsburg, N. J.
LongBr. Div.: J. F. Randolph, *Supt*.Long Branch, N.J.
N. J. So. Div.: R. Blodgett, *Supt* ...Manchester, N.J.
Wm. Montgomery, *M. M*....Manchester, N. J.
Chas. N. Sawyer, *M. C. B*....Manchester, N. J.
Lehigh & Susquehanna Div.:
W. S. Polhemus, *Supt*. .. Mauch Chunk, Pa.
L. C. Brastow, *Supt. Mach*........Ashley, Pa.
Central R. R. of S. C. (*See Wil. & Wel.*)
Central Iowa Ry. 4-8½ g. 354 m. 49 lo. 1,959 cars.
D. N. Pickering, *Gen. Supt*...Marshalltown, Ia.
John Player, *M. M*. ....Marshalltown, Ia.
T. L. Seevers, *M. C. B*........Marshalltown, Ia.
Central Pac. R. R. 4-8½ g. 3,780 m. 269 lo. 7,277 c.
A. N. Towne, *Gen. Man*.....San Francisco, Cal.
J. A. Fillmore, *Gen. Supt*...San Francisco, Cal.
R. H. Pratt, *A. G. Supt*.....San Francisco, Cal.
J. R. Watson, *Gen. Pur. Agt*..Sacramento, Cal.
A. J. Stevens, *Gen. M. M*.....Sacramento, Cal.
W. McKenzie, *Asst. G. M. M*..Sacramento, Cal.
Benj. Welch, *Gen. M. C. B*....Sacramento, Cal.
G. J. Turner, *Asst. G. M. C. B*.Sacramento, Cal.
Western; Visalia & Tulare Divs. and Northern Ry.
A. D. Wilder, *Supt*.........W. Oakland, Cal.
G. D. Welch, *M. M.* (W. Div.).W. Oakland, Cal.
W. B. Ludlow, *M. C. B.* (W. Div.) do.
S. Johnson, *M. M.* (T. Div.).......Tulare, Cal.
D. Rutherford, *M. M.* (N. Rd.).S. Vallejo, Cal.
Sacramento; Oregon Divs.; and Cal. Pac. R. R.
J. B. Wright, *Supt*. ....Sacramento, Cal.
M. W. Cooley, *M. M.* (S. Div.)Sacramento, Cal.
Truckee Div.: Frank Free, *Supt*.Wadsworth, Nev.
Geo. Gregg, *M. M*.......... Wadsworth, Nev.
Wm. McPherson, *F. Car Sh*..Wadsworth, Nev.
Humb't Div.: G. W. Coddington, *Supt*.Carlin, Nev.
W. F. Smith, *M. M*...............Carlin, Nev.
J. C. Doughty, *For. Car Sh*... ...Carlin, Nev.
Salt Lake Div.: A. G. Fell, *Supt*.....Ogden, Utah.
James Lamb, *M. M*.. ....Terrace, Utah.
A. Sherburne, *For. Car Sh* .....Ogden, Utah.
Los Angeles; and Yuma Divs. (So. Pac.):
E. E. Hewitt, *Asst. Supt*....Los Angeles, Cal.
James Velsir, *M. M*.........Los Angeles, Cal.
T. T. Gilleland, *For. Car Sh*. Los Angeles, Cal.
Arizona Divs. (So. Pac.):
A. A. Bean, *Asst. Supt*..........Tucson, Ariz.
W. F. Smith, *M. M*.. .. ..Tucson, Ariz.
Rio Grande and El Paso Divs. (So. Pac.):
J. Campbell, *Ass't Supt*.......El Paso, Texas.
H. C. Standish, *For. Sh*.....El Paso, Texas.
Central Vermont R. R. 4-8½ g. 548 m. 132 lo. 2,522 c.
J. W. Hobart, *Gen. Supt*.........St. Albans, Vt.
J. M. Foss, *Asst. Gen. Supt. & M. M*.St. Albans, Vt
No. Div.: I. B. Futvoye, *Supt*.....St. Johns, P. Q.
Rut. Div.: J. Burdett, *Supt*.. ....Rutland, Vt.
N. L. Davis, *M. M. & C. B*........Rutland, Vt.
Brat. Div.: E. F. Brooks, *Supt*...Brattleboro, Vt.
New London & No'n R. R. 143 m. 22 lo. 303 c.
G. W. Bentley, *G. Supt. & P. A*...New London, Ct.
I. W. Dow, *M. M*...............New London, Ct.
S. O. Banks, *M C. B*........ .. .New London, Ct.
Charleston & Savannah Ry. 5 g. 115 m. 17 lo. 98 c.
H. S. Haines, *Gen. Man*........ Savannah, Ga.
C. S. Gadsden, *Gen. Supt*......Charleston, S. C.
H. A. Ulmo, *M. M*.............. Savannah, Ga
Charlotte, Columbia & Augusta R. R. (*See Rich. & D.*.
Chateaugay R. R. 3 g. 34 m. 6 lo. 125 cars.
A. L. Inman, *Gen. Man*........Plattsburg, N. Y.
J. M. Davis, *Supt. & M. M*....Plattsburg, N. Y.
Chattaroi Ry. 4-8½ g. 43 miles 11 loco. 483 cars.
C. H. Rockwell, *Gen. Man. & P. A*.Ashland, Ky.
J. R. Martin, *M. M*... ....Ashland, Ky.
Joseph P. Burleigh, *M. C. B*.......Ashland, Ky.
Cheraw & Chester R. R. 3 g. 30 m. 3 lo. 38 cars.
W. H. Harding, *Pres. & Supt*.....Chester, S. C.
A. M. Manning, *M. M*...... ......Chester, S. C.
Cheraw & Darlington R. R. (*See Wil. & Wel.*)
Cheraw & Salisbury R. R. (*See Wil. & Wel.*)
John Postel, *Manager*...... ...Cedartown, Ga.
C. E. Scruton, *M. M. & C. B*....Cedartown Ga.
Chesapeake, Ohio & So.-W'n.
4-9 g. 398 m. 47 lo. 1,339 c.
D. W. C. Brown, *G. S. & Pur. Agt*..Louisville, Ky.
H. E. Huntington, *Pur. Agt*.....Louisville, Ky.
F. H. Britton, *Mast. Trans* ......Paducah, Ky.
W. D. Robb, *S. M. P. & M*..Elizabethtown, Ky.
Geo. Dickey, *M. M* ....Elizabethtown, Ky.
H. A. Wentzell, *M. M*...........Paducah, Ky.
Chesapeake & Ohio Ry. 4-8½ g. 642 m. 133 l. 3,543 c.
C. W. Smith, *Gen. Man*...... ....Richmond, Va.
D. A. Sweet, *Asst. to Gen. Man*.Richmond, Va.
A. H. Wood, *Asst. Gen. Supt.*, Huntington, W. Va.
A. S. Emmons, *Pur. Agt*..... ..Richmond, Va.
John McFarland, *Supt. M. P* ... Richmond, Va.
Eastern Div.: E. T. Smith, *Supt*..Richmond, Va.
J. N. King, *M. C. B*... ....Richmond, Va.
Hunt. Div.: W. P. Harris, *Supt*... Hinton, W. Va.
T. L. Chapman, *Asst. Supt. M. P.*; and
H. C. Bassinger, *M. C. B*.Huntington, W. Va.
Lex. Div.: J. D. Yarrington, *Supt*..Lexington, Ky.
Cheshire R. R. 4-8½ g. 80 m. 30 lo. 499 cars.
R. Stewart, *Gen. Man*......... ....Keene, N. H.
H. H. Stone, *Pur. Agt*.............Keene, N. H.
F. A. Perry, *M. M* ....Keene, N. H.
A. E. Howard, *G. For. Car Sh*.. ..Keene, N. H.
Chester & Lenoir Ry. 3 g. 50 m. 3 lo. 23 cars.
James Mason, *Supt*... ....Yorkville, S. C.
T. P. Beard, *M. M*............ ...Yorkville, S. C.
Chicago, B. & Kan. City Ry. 4-8½ g. 181 m. 9 lo. 130 c.
Robt. Law, *Gen. Supt*.......... .Keokuk, Ia.
W. H. Bartlett, *Act. M. M*......Burlington, Ia.
Chicago, Burlington & Quincy R. R.
4-8½ g. 2,924 m. 521 lo. 18,955 cars.
T. J. Potter, *Gen. Man*... ....Chicago, Ill.
(1) C., B. & Q., East of Mo. Riv. 1,938 miles.
H. B. Stone, *Gen. Supt*...... ......Chicago, Ill.
Geo. C. Smith, *Pur. Agt*...........Chicago, Ill.
G. W. Rhodes, *Supt. M. P*. . ...Aurora, Ill.
Wm. Forsyth, *Mech. Eng*.... ......Aurora, Ill.
Ill. Divs.: J. D. Besler, *Supt*........Galesburg, Ill.
Chi. Div.: Geo. Alexander, *Supt*.....Aurora, Ill.
L. E. Johnson, *M. M*...............Aurora, Ill.
Galesburg Div.: F. C. Rice, *Supt*.Galesburg, Ill.
Robert Colville, *M. M*......... Galesburg, Ill.
St. L. Div.: S. E. Crance, *Supt*.....St. Louis, Mo.
A. Forsyth, *M. M*......... ...Beardstown, Ill.
Ia. & Mo. Divs.: *Supt*..Burlington, Ia.
East. Div.: O. E. Stewart, *Supt*..Burlington, Ia
Joel West, *M. M*... ....Burlington, Ia.
Mid. Div.: J. B. Maxon, *Supt*.....Ottumwa, Ia.
West'n Div.: W. B. Ryder, *Supt*.... Creston, Ia.
C. W. Eckerson, *M. M*..... .....Creston, Ia.
(2) C., B. & Q., West of Mo. Riv. 935 miles.
G. W. Holdrege, *Gen. Supt*........Omaha, Neb.
Jas. M. Barr, *Pur. Agt*........ ..Omaha, Neb.
D. Hawksworth, *Gen. M. M*..Plattsmouth, Neb.
Bur. & Mo. Riv. & Neb. Ry. Divs.:
D. E. Thompson, *Supt*..... ...Lincoln, Neb.
E. Bignal, *M. M*.................Lincoln, Neb.
R. V. Div.: A. Campbell, *Supt*.....Hastings, Neb.
A. & N. Div.: J. McConniff, *Supt*...Lincoln, Neb.
Chicago, Milwaukee & St. Paul R. R.
4-8½ g. 4,383 m. 425 lo. 13,659 cars.
S. S. Merrill, *Gen. Man*........Milwaukee, Wis.
J. T. Clark, *Gen. Supt*..........Milwaukee, Wis.
J. T. Crocker, *Pur. Agt*........Milwaukee, Wis.
J. M. Lowry, *Gen. M. M*.......Milwaukee, Wis.
E. Fairbairn, *M. M*... ....Milwaukee, Wis.
John Bailie, *Supt. Car Dept*...Milwaukee, Wis.
(1) H. C. Atkins, *Asst. Gen. Supt*..Milwaukee, Wis.
Chi. Div.: S. J. Collins, *Supt* ... .Chicago, Ill.
La Crosse Div: W. G. Collins, *Supt*.Milwaukee, Wis.
C. Bluffs Div.: A. J. Earling, *Supt*....Marion, Ia.
P. du C. & M. Pt. Divs:
R. B Campbell, *Supt*.........Milwaukee, Wis.
(2) C. H. Prior, *Asst. Gen. Supt*..Minneapolis, Minn.
H. & D. Div.: M. W. Kellie, *Supt*. do.
J. O. Pattie, *M. M*..... ... Minneapolis, Minn.
Ia. & Minn. Div.: H. R. Williams, *Supt*. do.
So. Minn. & River Divs.:
C. W. Case, *Supt*........ ....Dubuque, Ia.
Ia. & Da. Div.: G. W. Sanborn, *Supt*.Mason City, Ia.
S. Cy. & Da. Div.: J. Jackson, *Supt*.Sioux City, Ia.
F. H. Moulton, *M. M*............Yankton, Dak.
Dubuque Div.: C. W. Case, *Supt*....Dubuque, Ia.
S. Charnley, *M. M*...... . .....Dubuque, Ia.
(3) D. A. Olin, *Asst. Gen. Supt*.........Racine, Wis
So.-Wn. Divs.: D. L. Bush, *Supt*......Racine, Wis.
John Taylor, *M. M*. ....Racine, Wis.
E. A. Eddy, *M. C. B*.......... ...Racine, Wis.
Northern Div.: L. B. Rock, *Supt*..Milwaukee, Wis.
Wm. E. Kittredge, *M. C. B*..Milwaukee, Wis.
Chicago, Pekin & So.-Wn. R.R. 4-8½ g. 88 m. 8 lo. 455 c.
A. H. Crocker, *Rec*.... .. .. Joliet, Ill.
J. N. Chilson, *M. C. B*....... ......Streator, Ill.
Chicago, Rock Island & Pac. Ry.
4-8½ g. 1,381 m. 300 lo. 7,760 cars.
R. R. Cable, *V. P. & Gen. Man*....Chicago, Ill.
A. Kimball, *Gen. Supt*.............Chicago, Ill.
H. F. Royce, *Asst. G. Supt*.... ..Davenport, Ia.
F. A. Marsh, *Pur. Agt*.............Chicago, Ill.
T. B. Twombly, *Gen. M. M*... .....Chicago, Ill.
B. K. Verbryck, *Gen. M. C. B*......Chicago, Ill.
Ill. Div.: R. H. Chamberlin, *Supt*.....Chicago, Ill.
R. Biester, *M. M*..................Chicago, Ill.
Sam'l Pullman, *M. C. B*...........Chicago, Ill.
Ia. Div.: Jno. Given, *Supt* ... .Des Moines, Ia.
J. G. Crockett, *M. M*................Stuart, Ia.
Jas. E. Morrill, *M. M*...........Davenport, Ia.
Chas. M. Leonard, *M. C. B*......Davenport, Ia.
So.-Wn. Div.: G. F. Walker, *Supt*.....Trenton, Ia.
R. O. Carscadin, *M. M*...........Trenton, Mo.
Chas. R. Best, *M. C. B*........ ....Trenton, Ia.
K. & Des. M. Div.: Jno. Given, *Supt*..DesMoines, Ia.
S. W. Wakefield, *M. M*............Keokuk, Ia.
Henry Kummer, *M. C. B*..........Keokuk, Ia.
Chi., Saginaw & Can. R. R. 4-8½ g. 38 m. 4 lo. 16 c.
J. A. Elwell, *Gen. Man. & Pur. Agt*.St. Louis, Mich.
Jas. T. Hall, *Supt*.............. St. Louis, Mich.
Chicago, St. Louis & New Orleans R. R.
4-8½ g. 571 m. 101 lo. 1,913 cars.
J. C. Clarke, *V. P. & G. Man*..New Orleans, La
L. T. Brien, *Asst. Gen. Man*..New Orleans, La.
C. M. Sheafe, *Gen. Supt*......New Orleans, La.
H. B. Febiger, *Pur. Agt*.......New Orleans, La.
W. H. Purdy, *Supt. Mach*..McComb City, Miss.
Geo. W. Baxter, *M. C. B*...McComb City, Miss.
So. Div.: E. D. Anderson, *Acting Supt*. do.
W. P. McKinley, *M. M*.... McComb City, Miss.
No. Div.: J. G. Mann, *Supt*........Jackson, Tenn.
J. M. Keith, *M. M*..... ...... Jackson, Tenn.
J. F. White, *M. M*........Water Valley, Miss.
Chicago, St. Paul, Minneapolis & Omaha Ry.
4-8½ g. 1,037 m. 131 lo. 4,688 cars.
J. M. Whitman, *Gen. Supt*......St. Paul, Minn.
W. H. S. Wright, *Pur. Agt*......St. Paul, Minn.
Matt. Ellis, *M. M*... ....St. Paul, Minn.
W. B. Rice, *M. C. B*......... ....St. Paul, Minn.
Ea. Div.: A. A. Hobart, *Supt*......St. Paul, Minn.
No. Div.: T. P. Gere, *Supt*...... ...St. Paul, Minn.
St. Paul Div.: J. F. Lincoln, *Supt*.St. Paul, Minn.
Sioux City Div.: H. Spencer, *Supt*.Sioux City, Ia.
F. W. Heintselman, *Gen. For. Sh*. Sioux Cy, Ia.
Neb. Div.: G. V. Morford, *Supt*......Omaha, Neb.
Chicago, Texas & Mexican Central Ry.
4-8½ g. 52 m. 4 lo. 60 cars.
Gen. Supt..... ....Dallas, Tex.
Chas. Howard, *Pur. Agt*.......... Chicago, Ill.
Chicago & Alton R. R. 4-8½ g. 840 m. 213 lo. 6,148 c.
J. C. McMullin, *Gen. Man*..........Chicago, Ill.
C. H. Chappell, *Act. Gen. Man*....Chicago, Ill
W. F. Merrill, *Gen. Supt*.......... Chicago, Ill
A. V. Hartwell, *Pur. Agt*.......... Chicago, Ill
Wm. Wilson, *Supt. of Mach*...Bloomington, Ill
Jos. Townsend, *G. For. Car Dept* do.
Chi. Div.: A. M. Richards, *Supt*..Bloomington, Ill.
St. Louis Div.: T. M. Bates, *Supt*..Roodhouse, Ill.
Wm. McPhail, *M. M*....... ....Slater, Mo.
Chi. & East'n Ill. 4-8½ g. 248 m. 56 lo. 3,500 cars.
O. S. Lyford, *Gen. Supt*............Chicago, Ill.
D. R. Patterson, *Pur. Agt*... ......Chicago, Ill.
P. W. Drew, *M. Trans*.............Chicago, Ill.
Allen Cooke, *M. M*.............. ....Danville, Ill.
Chicago & Grand Trunk Ry. (*See Grand Trunk.*)
Chicago & Iowa R. R. 4-8½ g. 104 m. 16 lo. 237 cars.
T. J. Potter, *Gen. Man*.... ....Chicago, Ill.
W. H. Holcomb, *Gen. Supt*........Rochelle, Ill.
H. S. Bryan, *M. M*....... .... Aurora, Ill.
Chicago & Northwestern Ry.
4-8½ g. 3,476 m. 558 lo. 18,685 cars.
Marvin Hughitt, *2d V. Prs. & G. M*.Chicago, Ill.
J. D. Layng, *Gen. Supt*.............Chicago, Ill.
R. W. Hamer, *Pur. Agt*. .... .Chicago, Ill.
Geo. W. Tilton, *Supt. M. P. & M.*; and
J. M. Boon, *A. Supt. M. P. & M*.. .Chicago, Ill.
Wis. and Mil. Divs. & Sheboygan & W'n Ry.:
Chas. D. Gorham, *Supt*.... ......Chicago, Ill.
Gal. Div.: Chas. Murray, *Supt*....... Chicago, Ill.
Pen'r Div.: W. B. Linsley, *Supt*....Escanaba, Mich.
Geo. H. White, *M. M*..... ... Escanaba, Mich.
Mad. Div.: C. A. Swineford, *Supt*..Baraboo, Wis.
Win. & St. P. Div.: S. Sanborn, *Supt*.Winona, Minn
W. A. Scott, *M. M*.... ....Winona, Minn.
Dak. Cen. Ry.: T. J. Nicholl, *Supt*....Huron, Dak.
Ia. Div.: M. Hopkins, *Supt*.......... .Clinton, Ia.
Geo. W. Lowe, *M. M. & M. C. B*.Clinton, Ia.
No. Ia. Div.: H. G. Burt, *Supt*.... Eagle Grove, Ia.
Chicago & West Michigan:
4-8½ g. 409 m. 43 lo. 1,345 cars.
Geo. C. Kimball, *V. P. & G. Man*.Muskegon, Mich.
C. Harris, *Gen. Supt* ....Muskegon, Mich.
H. Park, *Pur. Agt*..... ......Muskegon, Mich.
W. F. N. Davis, *M. M*.........Muskegon, Mich.
Cincinnati, Columbus & Hocking Val. Ry.
4-9 g. 25 m. 1 lo. 27 cars.
D. P. Hyatt, *Gen Man*... ....Dayton, O.
Geo. F. Robinson, *Supt*. ...... Washington, O.
Cin., Georgetown & Portsmouth. 3 g. 35 m. 2 lo. 39 c.
M. Simmons, *Supt*................Cincinnati, O.
J. C. Homer, *M. M*. . ...Cincinnati, O.
Cincinnati, Green Riv. & Nashville R. R. 3 g.
A. C. Sim, *Supt*...........King's Mountain, Ky.
G. Brashears, *Pur. Agt*... ..... Cincinnati, O.
Cincinnati, Hamilton & Dayton R. R.
Geo. S. Griscom, *Gen. Supt*......Cincinnati, O.
John Black, *Gen. M. M*... .... Lima, O.
W. H. H. Allison, *M. C. B*........Cincinnati, O.
C. R. & C. Div.: W. S. Brewer, *M. M*.Richm'd, Ind.
Cincinnati, Indianapolis, St. Louis & Chicago Ry.
4-8½ g. 370 m. 71 lo. 3,279 cars.
J. W. Sherwood, *Supt*.... ...Indianapolis, Ind.
Geo. Tozzer, *Pur. Agt*...... .....Cincinnati, O.
J. S. Patterson, *M. of Mach. & M. C. B*.Cincinn., O.
Cincinnati, New Orleans & Texas Pacific Ry. Co.
5 g. 841 m. 123 lo. 2,687 cars.
John Scott, *V. Pres. & Gen. Man*..Cincinnati, O.
R. W. Healey, *Gen. Pur. Agt*.....Cincinnati, O.
James Meehan, *Gen. M. M*... ...Cincinnati, O.
Cin. So. Div.: R. Carroll, *Gen. Supt*.... Cin., O
I. W. Fowle, *M. M*. ....Cincinnati, O.
John Richardson, *M. C. B*.....Cincinnati, O.
A. Thomson, *M. M*... ...Chattanooga, Tenn.
Ala. Gr. S'n Div.: C. B. Wallace, *Gen. Supt*.. and
George Manuell, *M. M*....Chattanooga, Tenn.
Fred Morgan, *M. C. B*...Chattanooga, Tenn
V. & M. Div.: E. F. Raworth, *G. S*.Vicksburg, Miss
James B. Browne, *M. M*.....Vicksburg, Miss.
V. S. & P. Div.: F. Y. Dabney, *Supt*..Monroe, La.
W. Bell Smith, *M. M. & C. B*....Monroe, La.
Cincinnati Northern Ry. 3 g. 30 m. 4 lo. 60 c.
G. L. Barringer, *Gen. Man*.. ... Cincinnati, O.
T. J. Hamer, *M. M. & C. B*.......Cincinnati O
Cincinnati, Selma & Mobile R.R. 5 g. 71 m. 6 lo. 135 c.
D. McLaren, *Supt*....... ....Selma, Ala.
H. L. Wright, *Pur. Agt*... ....Selma, Ala.
J. M. Levis, *M. M*...................Marion, Ala.
Cin., Wash. & Balt. 4-8½ g. 312 m. 65 lo. 1,422 cars.
Jas. H. Stewart, *Gen. Man*.......Cincinnati, O.
Edw. Evans, *M. M*........... ....Chillicothe, O
Cin., Wabash & Mich. Ry. 4-8½ g. 165 m. 13 lo. 290 c
Norman Beckley, *Gen. Man. & P. A*.Elkhart, Ind
O. W. Lamport, *Supt*...... ....Wabash, Ind
S. B. Tinker, *M. M. & M. C. B*....Wabash, Ind
Cincinnati & Eastern Ry. 3 g. 76 m. 4 lo. 66 cars
S. Woodward, *Gen. Man*.... .. .Cincinnati, O.
P. W. Naughton, *M. M*...........Cincinnati, O.
Clarksburg, Weston & Glenville R. R.
3 g. 26 m. 3 lo. 28 cars.
A. H. Kunst, *Pres. and Gen. Man*.Weston, W. Va.
Sam. A. Steel, *M. M*...........Weston, W. Va.
F. Dillie, *M. C. B*........ .. ...,Nottingham, O.
Cleveland, Columbus, Cincinnati & Indiana and Indianapolis & St. Louis Rys. and Dayton & Union R. R. 4-8½ g. 780 m. 246 lo. 7,082 cars.
E. B. Thomas, *Gen. Man*.........Cleveland, O.
J. L. Yale, *Pur. Agt*.......... ....Cleveland, O.
W. F. Turreff, *Gen. M. M*.........Cleveland, O.
Robt. Wiggins, *Gen. For*......... Delaware, O.
Col. & Cin. Div.: Robt. Blee, *Supt* .Cleveland, O.
W. L. Gilmore, *M. M*...........Cleveland, O.
A. G. Steinbrenner, *G. For. Car Dept*. do.
Ind'p'lis Div.: John O. Ewan, *Supt*..Ind'polis, Ind.
J. K. Lape, *M. M*............Brightwood, Ind.
N. Mark, *G. For. Car Dept*.Brightwood, Ind.
Ind. & St. L Ry.: Tho. Burrows, *Supt*.St. Louis, Mo.
T. W. Ranson, *M. M. & C. B*....Mattoon, Ill.
Day. & Un. Rd.: J. H. Barrett, *Supt*.Cincinnati, O.
H. S. Gordon, *M. M*... ....Dayton, O.
Cleveland, Mt. Vernon & Delaware R. R.
4-9 g. 144 m. 22 lo. 751 c.
N. Monsarrat, *Gen Supt*.............Akron, O.
G. M. Taylor, *M. M. & C. B*.....Mt. Vernon, O.
Cleve., Youngstown & Pitts. R. R. 3 g. 30 m. 3 lo 112 c.
J. B. Lawley, *Gen. Supt*.... ....Alliance, O.
C. H. Dorman, *M. M. & M C. B*....Alliance, O.
Cleveland, Lorain & Wheeling Ry.
4-8½ g. 158 m. 23 lo. 1,522 cars.
Oscar Townsend, *Gen. Man*......Cleveland, O.
Wm. Thornburg, *Supt*... .... Lorain, O.
Cleve. & Marietta R. R. 4-8½ g. 99 m. 9 lo. 157 cars.
S. C. Baldwin, *Gen. Man* . . .. Marietta, O.
M. D. Woodford, *Gen. Supt*........Marietta, O.
R. B. Hoover, *Pur. Agt*.... . ....Marietta, O.
Cleveland & Pittsburg R. R. (*See Penna. Co.*)
Coburg, Peterborough & Marmora Ry.
5-6 g. 47 m. 5 lo. 207 cars.
Jas. R. Barber, *Gen. Supt*... ....Cobourg, Ont.
Jas. Clark, *M. M*... .... Cobourg, Ont
John Tinney, *M. C. B*....... ....Cobourg, Ont.
Columbia & Greenville R. R. (*See Rich. & Dan.*)
Columbus, Hocking Valley & Toledo Ry.
4-9 g. 319 m. 90 lo. 7,257 cars.
M. M. Greene, *Gen Man*...........Columbus, O.
G. R. Carr, *Gen. Supt*..............Columbus, O.
W. M. Greene, *Pur. Agt*...........Columbus, O.
Ira G. Hutchins, *M. M*....... ....Columbus, O.
J. M. Rockafield, *M. C. B*..... ... .Columbus, O.
Tol. Div.: M. T. Seymour, *Supt*......Columbus, O.
Hock. V. Div.: M. P. L. Booth, *Supt*.Columbus, O.
Ohio Riv. Div.: C. D. Norris, *Supt*.......Logan, O.
Columbus & Maysville Ry. (*See Cin. & East.*)
Columbus & Rome R. R. 3 g. 33 m. 2 lo. 25 cars.
M. E. Gray, *Supt* ... . .Columbus, Ga.
Columbus & Western Ry. 5 g. 89 m. 2 lo. 19 cars
E. A. Llewellen, *Gen. Man*. ...Columbus, Ga.
R. A. Bridges, *M. M* ....Opelika, Ala.
Concord R. R. 4-8½ g. 141 m. 37 lo. 1,010 cars
H. E. Chamberlain, *Supt. & P. Agt*.Concord, N.H.
J. T. Gordon, *M. M. & C. B*... .Concord, N. H.
Conn. Riv. and Ver. Val. R. Rs. 4-8½ g. 130 m. 33 lo. 456 c
J. Mulligan, *Supt. & Pur. Agt*.Springfield, Mass
W. H. Stearns, *M. M*........ .Springfield, Mass.
Robert Hitchcock, *M. C. B*...Springfield, Mass
Connotton Valley R. R. 3 g. 160 m. 26 lo. 896 cars.
Samuel Briggs, *Gen. Man*... . .. ...Canton, O.
B. C. Bosworth, *M. M*.............. .Canton, O.
Cornwall R. R., 4-8½ g. 9 m 5 lo. 166 cars.
Frank Donahue, *G. Supt. & M. M*.Lebanon, Pa.
Levi Blonch, *M. C. B* ....Lebanon, Pa.

Credit Valley Ry. 4-8½ g. 184 m. 22 lo. 535 cars.
James Ross, *Gen. Supt*..........Toronto, Ont.
John Macnab, *Pur. Agt*..........Toronto, Can.
H. G. Taylor, *Mech. Supt*..........Toronto, Can.
Crown Point Iron Co. R. R. 3 g. 13 m.
A. L. Inman, *Gen. Man*..........Plattsburg, N. Y.
J. M. Davies, *Supt. & M. M.*..Crown Point, N. Y.
J. C. Sherman, *M. C. B*..........Crown Point, N. Y.
Cumberland Valley R. R. 4-9 g. 125 m. 21 lo. 430 cars.
J. F. Boyd, *Supt*..........Chambersburg, Pa.
A. S. Hull, *M. M*..........Chambersburg, Pa.
C. Wickey, *F. C. R*..........Chambersburg, Pa.
Cumberland & Penn. R. R. 4-8½ g. 55 m. 28 lo. 625 c.
P. L. Burwell, *Gen Supt & P A.*Cumberland, Md.
N. W. Howson, *Mast. of Mach.*Mt. Savage, Md.
Nathan Binix, *M. C. B*..........Mt. Savage, Md.

D

Danbury & Norwalk R. R. 4-8½ g. 33 m. 6 lo. 100 c.
L. W. Sandiforth, *G. Supt. & P. A.*..S. Norwalk, Ct.
N. M. George, *M. M. & C. B*....Danbury, Conn.
Danville, Mocksville & So.-Wn. R. R. 3 g. 28 m.
H. W. Goodrich, *Ch. Eng*.....Leakesville, N. C.
Danville, Olney & O. R. R. R. 4-8½ g. 110 m. 4 lo. 83 c.
Jas. R. Maxwell, *G. Man. & P. A*.....Olney, Ill.
J. M. Graham, *Supt*..........Kansas, Ill.
Louis Parisoe, *M. M & C. B*..........Kansas, Ill.
Dayton & Union R. R. (*See Ohio Ry.*)
Del., Lackawanna & W. and N. Y., Lack. & W. R. Rs.
4-8½ g. 670 m. 348 lo. 26,187 cars.
Wm. F. Halstead, *Gen. Supt*.....Scranton, Pa.
G. W. B. Cushing, *Pur. Agt*. . New York, N. Y.
Walter Dawson, *Mast. of Mach*...Scranton, Pa.
Robt. McKenna, *M. C. B*..........Scranton, Pa.
Bloomsb'g Div.: C. Graham, *M. M.*.Kingston, Pa.
Utica Div.: A. C. Salisbury, *Supt*....Utica, N. Y.
Thos. Thatcher, *M. M*..........Utica, N. Y.
Morris & Essex Div.; Sussex; P. & D. and C. R. Rs.
A. Reasoner, *Supt*..........Hoboken, N. J.
W. H. Lewis, *M. M*.......... Kingsland, N. J.
J. W. Baker, *Mast. Car Rep*. ....Dover, N. J.
Oswego & Syracuse Div.:
W. B. Phelps, *Supt*..........Oswego, N. Y.
Jas. Buchanan, *M. M*. .. Syracuse, N. Y.
Syracuse, Binghamton & New York R. R.
4-8½ g. 81 m. 20 lo. 598 cars.
W. K. Niver, *Gen. Supt*.....Syracuse, N. Y.
Jas. Buchanan, *M. M*.........Syracuse, N. Y.
Delaware & Hudson Canal Co.
4-3 and 4-8½ g. 596 m. 151 lo. 9,248 cars.
C. F. Young, *Gen. Man*.......... Honesdale, Pa.
C. F. Young, *Pur. Agt*..........Albany, N. Y.
R. C. Blackall, *Supt. of Mach*.....Albany N. Y.
Susq. Div.: C. D. Hammond, *Supt*. Albany, N. Y..
C. A. Jones, *M. M*..............Oneonta, N. Y.
J. R. Skinner, *M. C. B*. ....Oneonta, N. Y.
Sar. & Ch. Divs.: T. Voorhees, *Supt*...Troy, N. Y.
J. L. Corey, *M. M*......... Green Island, N. Y.
Chr. Körner, *M. C. B*..... Green Island, N. Y.
Pa. Div.: R. Manville, *Supt & Pur Agt*. and
S. H. Dotterer, *M. M*.......Carbondale, Pa.
T. Orchard, *M. C. B*.......... Carbondale, Pa.
Denver & New Orleans. 4-8½ g. 140 m. 11 lo. 400 c.
C. W. Fisher, *Gen. Man*...........Denver, Col.
Chas. Wheeler, *Pur. Agt*..........Denver, Col.
S. P. Weller, *M. M. & M. C. B*.....Denver, Col.
Denver & Rio Grande Ry. 3 g. 1,062 m. 170 lo. 4,617 c.
D. C. Dodge, *Gen. Man*..........Denver, Col.
Henry Wood, *Gen. Supt*..Salt Lake City, Utah.
A. B. Garner, *Pur. Agt*..........Denver, Col.
N. W. Sample, *M M*..........Denver, Col.
M. C. B.........Burnham, Col.
1st Div.: W. H. Bancroft, *Supt*....S. Pueblo, Col.
2d Div.: Cole Lydon, *Supt*. .... Alamosa, Col.
3d Div.: G. W. Cook, *Supt*........Leadville, Col.
4th Div.: R. M. Ridgway, *Supt*.......Salida, Col.
5th Div.: J. A. Myers
Des Moines & Ft. Dodge. 4-8½ g. 143 m. 13 lo. 232 c.
C. N. Gilmore, *Supt*............Des Moines, Ia.
John McGrayel, *M. M*......Grand Junction, Ia.
E. A. Avery, *M. C. B*.......Grand Junction, Ia.
Det., Gr. H. & Mil. Ry. 4-8½ g. 189 m. 36 lo. 478 c.
G. R. Nash, *Gen. Man*..........Detroit, Mich.
John S. Lorimer, *Storekeeper*....Detroit, Mich.
W. J. Morgan, *Supt*..........Detroit, Mich.
F. Parker, *Mech. Supt*..........Detroit, Mich.
Det., Lansing & No'n R. R. 4-8½ g. 222 m. 84 lo. 1027 c
John B. Mulliken, *Gen. Man*......Detroit, Mich.
Allan Bourn, *Pur. Agt*...........Detroit, Mich.
Thos. M. Fish, *Gen. Supt*..........Ionia, Mich.
G. C. Watrous, *M. M. & C. B*......Ionia, Mich.
Det., Mack. & Marq. R. R. 4-8½ g. 151 m. 16 lo. 1112 c.
D. McCool, *Gen. Supt*.........Marquette, Mich.
E. W. Allen, *Pur. Agt*..........Marquette, Mich.
John Wilson, *Mech. Supt*......Marquette, Mich.
Dorchester & Delaware R. R. 4-8½ g. 33 m.
Thos. E. Wright, *Supt*..........Cambridge, Md.
Dubuque & Dakota R. R. 4-8½ g. 64 m. 2 lo. 54 cars.
A. C. Goodrich, *Supt*..............Waverly, Ia.
W. S. Couch, *Pur. Agt*..........Dubuque, Ia.
Duck River Valley R. R. 3 g. 34 m.
Geo. Childress, *Supt*..........Columbia, Tenn.
Dunkirk, Allegheny Valley & Pittsburgh R. R.
4-8½ g. 91 m. 14 lo. 102 cars.
D. Thayer, *Gen. Supt*............Dunkirk, N. Y.
R. C. Moore, *Pur. Agt*...... .New York, N. Y.
J. C. Haggett *M. M. & C. B*.....Dunkirk, N. Y.

E

East Broad Top R. R. 3 g. 30 m. 6 lo. 191 cars.
A. W. Sims, *Supt*.................Orbisonia, Pa.
A. B. Greenwood, *M. M*..........Orbisonia, Pa.
East Tennessee, Virginia & Georgia R. R.
5 g. 1,185 m. 133 lo. 1,597 cars.
Henry Fink, *V. P. & Gen. Man.*Lynchburg, Va.
J. F. O'Brien, *Gen. Supt*.......Knoxville, Tenn.
W. A. Harrison, *Pur. Agt*. ...Knoxville, Tenn.
East Tenn. Div. and No. Car. and Ohio Branches:
F. K. Huger, *Supt*...........Knoxville, Tenn.
B. J. Sitton, *M. M*..........Knoxville, Tenn.
Jos. Armbruster, *M. C. B*....Knoxville, Tenn.
Alabama Div.: J. M. Bridges, *Supt*...Selma, Ala.
Simon Gay, *M. M*.......... Selma, Ala.
W. W. Pierce, *M. C. B*..........Selma, Ala.
Memphis & Charleston R. R. (Div.):
R. B. Pegram, Jr., *Supt*..... Memphis, Tenn.
H. N. Burford, *M. M*..........Memphis, Tenn.
Macon & Brunswick Div.:
J. F. Mallory, *Supt*....Macon, Ga
C. H. Beale, *M M*.......... Macon, Ga
Ga. Div.: *Supt*..........Atlanta, Ga.
M. J. Rogers, *M. M*..........Atlanta, Ga
East & West R. R. of Alabama.
John Postell, *Manager*.....Cross Plain, Ala.
Eastern R. R. 4-8½ g. 283 m. 99 lo. 2,268 cars.
Payson Tucker, *Gen. Man*........Boston, Mass.
D. W. Sanborn, *Mast. of Trans*..Boston, Mass.
G. F. Hurd, *Pur. Agt*.............Boston, Mass.
Amos Pillsbury, *S. M. P. & M*...E. Boston, Mass.
J. D. Billings, *G. For. Car Dept*...Salem, Mass.
Con'y Div.: J. W. Sanborn, *Supt*..Wolfboro J., N.H.
Eastern Kentucky R. R. 4-8½ g. 34 m. 5 lo. 123 c.
H. W. Bates, *Man. & Pur. Agt*... Riverton, Ky.
D. S. Weaver, *M. M*..........Riverton, Ky.
Eastern Shore R. R. 4-8½ g. 38 m. 2 lo.
W. Thompson, *Supt*..........Princess Anne, Md.
F. Strattner, *M. M*......... Princess Anne, Md.
Elberton Air-Line R.R. (*See Rich. & Dan. N. G. Brs.*)
Erie & Pittsburg R. R. (*See Penna. Co.*)
Eureka & Palisade R. R. 3 g. 97 m. 7 lo. 124 cars.
B. Gilman, *Gen. Supt & Pur. Agt*..Eureka, Nev.
E. C. Mills, *M. M*..........Palisade, Nev.
A. S. Longley, *M. C. B*..........Palisade, Nev.
Europ. & No. Amer. Ry. 4-8½ g. 114 m. 15 lo. 557 c.
F. W. Cram, *Supt. & Pur Agt*....Bangor, Me.
A. O. Bailey, *M. M. & C. B.* Mattawamkeag, Me.
Evansville, Paducah & Cairo Line. 200 miles
G. J. Grammer, *Supt*..........Evansville, Ind.
Evansville, Rockport & E'n Ry. 4-9 g. 71 m. 5 lo. 98 c.
H. L. Shepard, *Supt*............Evansville, Ind.
Evansv. & Terre Haute. 4-8½ g. 145 m. 26 lo. 900 c.
C. J. Hepburn, *Gen. Supt*..... Evansville, Ind.
John Torrance, *Gen. For*......Evansville, Ind.

F

Fitchburg R. R., 4-8½ g. 189 m. 100 lo. 3,315 cars.
John Adams, *Gen. Supt*..........Boston, Mass.
E. K. Turner, *Asst Supt*... Fitchburg, Mass.
F. S. Pratt, *Pur. Agt*..........Boston, Mass.
G. A. Coolidge, *Supt. M. P*........Boston, Mass.
W. A. Foster, *Asst. Supt. M. P.*..Fitchburg, Mass.
J. W. Marden, *M. C. B*... Charlestown, Mass.

Flint & Pere Marq. 4-8½ g. 345 m. 68 lo. 1,854 cars.
H. C. Potter, *Gen. Man*......E. Saginaw, Mich.
D. Edwards, *Asst. Gen. Man*..E. Saginaw, Mich.
G. G. Cook, *Pur. Agt*.........E. Saginaw, Mich.
Sanford Keeler, *Gen. Supt*..E. Saginaw, Mich.
W. F. Potter, *Supt*. (E. Div.)..E. Saginaw, Mich.
M. V. Meredith, *Supt*. (W. Div.)E. Saginaw, Mich.
T. J. Hatswell, *M. M*...... .E. Saginaw, Mich.
R. McPherson, *M. C. B*.......E. Saginaw, Mich.
Florida Central & Western R. R.
5 g. 234 m. 16 lo. 160 cars.
Wm. M. Davidson, *Gen. Man.*Jacksonville, Fla.
Jas. S. McElroy, *Supt*..........Tallahassee, Fla.
Florida Southern Ry. 3 g. 91 m. 6 lo. 96 cars.
H. S. Ming, *Gen. Supt*.............Palatka, Fla.
M. R. Miller, *M. M. & C. B*.... .Palatka, Fla.
Florida Transit R. R. 5 g. 224 m.
D. E. Maxwell, *Gen. Supt*.... .Fernandina, Fla.
John Hedges, *Pur. Agt*. ...Fernandina, Fla.
R. V. Dahoney, *M. M*.........Fernandina, Fla.
G. Hernandez, *M. C. B*..... .Fernandina, Fla.
Fonda, Johnst'n & Gloversv. 4-8½ g. 26 m. 5 lo. 18 c.
Lawton Caten, *Supt*..........Gloversville, N. Y.
Fond du Lac, Amboy & Peoria. 3 g. 30 m. 2 lo. 35 c.
Alonzo Kinyon, *Supt. & P. A.*Fond du Lac, Wis.
Fort Dodge & Fort Ridley R. R. 4-8½ g.
G. R. Pearson, *Supt*..........Fort Dodge, Ia.
Ft. Madison & No.-West'n Ry. 3 g. 41 m. 4 lo. 120 c.
S. B. Kenrick, *Supt. & Pur. Agt.*Ft. Madison, Ia.
I. L. Lamb, *M. M. & C. B*......Ft. Madison, Ia.
Ft. Wayne, Cin. & Louisv. 4-8½ g. 108 m. 9 lo. 249 c.
White Water R. R. 4-8½ g. 62 m. 5 lo. 170 cars.
W. W. Worthington, *Gen. Supt*...Ft. Wayne, Ind.
T. H. Haberkorn, *M. M*.........Ft. Wayne, Ind.
Wm. Knight, *M. C. B*..........Ft. Wayne, Ind.
Fulton County N. G. Ry. 3 g. 61 m. 3 lo. 106 cars.
A. C. Atherton, *Gen. Supt. & P. Agt.*Lewiston, Ill.

G

Galveston, Harrisburg & San Antonio Ry.
4-8½ g. 492 m. 47 lo. 1870 cars.
A. N. Towne, *Gen. Man*..........Houston, Tex.
E. G. Thompson, *Supt*..........Houston, Tex.
El Paso Div.: Jas. Campbell, *Supt*..El Paso, Tex.
J. L. Bonner, *M. M*..........El Paso, Tex.
San Anto. Div.: W. G. Van Vleck, *Supt*.,
San Antono, Tex.
J. J. Ryan, *M. M*............San Antonio, Tex.
Houston Div.: H. Flanders, *Supt*..Harrisburg, Tex.
D. T. Davis, *M. M*............Harrisburg, Tex.
Louisiana Div.: W. Irwin, *Supt*.....Houston, Tex.
D. C. Smith, *M. M*..............Houston, Tex.
Galveston, Houston & Henderson R. R.
4-8½ g. 50 m. 17 lo. 212 cars.
W. H. Harding, *G. Man. & P. Agt.*Galveston, Tex.
Allen McCoy, *Supt*..............Galveston, Tex.
J. G. Conlon, *M. M*.......... Galveston, Tex.
Geneva, Ithaca & Sayre R. R. (*See Lehigh Val.*)
Georgia R. R. 5 g. 307 m. 42 lo. 938 cars.
John W. Green, *Gen. Man*.........Augusta, Ga.
John S. Cook, *M. M*............... Augusta, Ga.
T. M. Preval, *M. C. B*..........Augusta, Ga.
Georgia Pacific Ry. (Miss. Div.). 3 g. 43 m. 2 lo. 44 c.
G. J. Foreacre, *Supt*.............. .Atlanta, Ga.
W. M. Sutton, *Pur. Agt*.......Greenville, Miss.
Benj. Davis, *M. M*..........Greenville, Miss.
J. B. Shelton, *M. C. B*. ..... .Greenville, Miss.
Grand Haven R. R (*See Chic. & W. Mich.*)
Grand Junction R'y. (*See Midland of Can.*)
G'd Rap., Newaygo & L. S. R. R. (*See Chic. & W. M.*)
Grand Rapids & Indiana. 4-8½ g. 456 m. 52 lo. 1,566 c.
W. O. Hughart, *Gen. Man.*Grand Rapids, Mich.
W. R. Shelby, *Pur. Agt*....Grand Rapids, Mich.
S. D. Bradley, *M. M*..... Grand Rapids, Mich.
No'n Div.: J. M. Metheany, *Supt.*G'nd Rap., Mich.
So'n Div.: P. S. O'Rourke, *Supt.*Fort Wayne, Ind.
Grand Tower & Carbondale. 4-8½ g. 25 m. 6 lo. 357 c.
T. M. Williamson, *Supt. & P. A*..Gr. Tower, Ill.
Hugh Smith, *M. M. & C. B*....Grand Tower, Ill.
Grand Trunk Ry. 4-8½ g. 2,321 m. 434 lo. 9,403 c.
Joseph Hickson, *Gen. Man*.. ...Montreal, Can.
Wm. Wainright, *Asst. Man*......Montreal, Can.
Gr. Tr. Divs.: W. J. Spicer, *Supt.*Montreal, Can.
Jno. Taylor, *Gen. Storekeeper.*Montreal, Can.
Herbert Wallis, *Mech. Supt*...Montreal, Can.
Wm. McWood, *Supt. Car Dept.*Montreal, Can.
F. R. F. Brown, *Man. Lo. Wks.*Montreal, Can.
J. Haskoni, *Div. M. S*.. ... Richmond, P. Q.
F. L. Wanklyn, *Div. M. S*. ..Brockville, Ont.
J. Davis Barnett, *Div. M. S*....Stratford, Ont.
Chi. & Gr. Trunk Ry. 4-8½ g. 330 m. 56 lo. 1,191 c.
S. R. Callaway, *Gen. Man*....... Chicago, Ill.
W. H. Pettibone, *Supt*. ..Battle Creek, Mich.
A. Judd, *Pur. Agt*..........Fort Gratiot, Mich.
H. Roberts, *Asst. M. S*.....Port Huron, Mich.
Great West'n Div.: 4-8½ g. 823 m. 216 lo. 5,039 c.
Chas. Stiff, *Supt*..............Hamilton, Ont.
E. R. Baines, *Store Kpr*........ London, Ont.
C. K. Domville, *Mech. Supt*.. .Hamilton, Ont.
C. F. Hanson, *Lo. For*..........London, Ont.
J. D. McIlwain, *Supt. Car Dept*..London, Ont.
Green Bay, Winona & St Paul R. R.
4-8½ g. 250 m. 19 lo. 599 cars.
Timothy Case, *Gen. Man. & P. A.*Green Bay, Wis.
A. Fenwick, *M. M*.......... Ft. Howard, Wis.
Gulf, Col. & Santa Fé Ry. 4-8½ g. 536 m. 43 lo. 1,460 c.
John Sealy, *Gen. Man*........Galveston, Texas.
F. P. Killeen, *Asst. Gen. Man.*Galveston, Texas.
Jno. W. Thorne, *Pur. Agt*....Galveston, Texas.
G. B. Nichols, *M. M*..........Galveston, Texas.
W. H. Martin, *M. C. B*........Galveston, Texas.
Gulf, W'n Texas & Pac. Ry. 4-8½ g. 68 m. 6 lo. 70 c.
M. D. Monserrate, *Pr. & Supt*....Cuero, Texas.
James Mooney, *M. M*..........Cuero, Texas.

H

Halifax & Cape Breton Ry. 4-8½ g. 79 m. 9 lo. 268 c.
H. Abbott, *Manager*.........New Glasgow, N. S.
Hannibal & St. Jo. R. R. 4-8½ g. 292 m. 76 lo. 1,860 c.
John B. Carson, *Gen. Man*..........Hannibal, Mo.
W. R. Woodard, *Supt*..........Hannibal, Mo.
T. L. Dunn, *Ch. Eng. & Pur. Agt*..Hannibal, Mo.
Jas. Long, *Supt. M. P. & Car Dep.*Hannibal, Mo.
Hanover Junction, Hanover & Gettysburg R. R.
4-8½ g. 74 m. 9 lo. 106 cars.
H. D. Scott, *Gen. Supt*..........Hanover, Pa.
John J. Bingley *M. M*..........Hanover, Pa.
Henry Britcher, *M. C. B*..........Hanover, Pa.
Harrisburg & Potomac R. R. 4-8½ g. 35 m. 3 lo. 34 c.
R. H. Middleton, *Supt*......Boiling Springs, Pa.
Hartford & Conn. Val. R. R. 4-8½ g. 45 m. 9 lo. 196 c.
Samuel Babcock, *Pr. & Gen. Man.*Hartford, Ct.
Levi Woodhouse, *Asst. Supt*.. Hartford, Ct.
S. E. Brewer, *M. M. & C. B*.....Hartford, Conn.
Hartford & Conn. W'n R. R. 4-8½ g. 110 m. 16 lo. 495 c.
John F. Jones, *Supt*..........Hartford, Ct.
J. C. Barton, *M. M*..........Hartford, Ct.
Housatonic R. R. 4-8½ g. 126 m. 22 lo. 495 cars.
W. H. Yeomans, *Supt*..........Bridgeport, Ct.
D. S. Draper, *Pur. Agt*..........Bridgeport, Ct.
N. Slingland, *M. M*..........Falls Village, Ct.
J. J. Ferris, *M. C. B*..........Falls Village, Ct.
Houston Belt Ry. 4-8½ and 3 gauge 50 miles.
S. L. Werden, *V. P. & Gen. Man*. Houston, Tex.
Houston, East & West Tex. Ry. 3 g. 120 m. 10 lo. 478 c.
Paul Bremond, *Pr. & Pur. Agt*..Houston, Tex.
E. L. Bremond, *Gen. Man*..........Houston, Tex.
B. O. Diffey, *M. M*..........Houston, Tex.
C. F. Schelewa, *M. C. B*. .....Houston, Texas.
Houston & Tex. Cen. Ry. 4-8½ g. 750 m. 78 lo. 2,526 c.
G. Jordan, *V. Pr. & Gen. Man*....Houston, Tex.
A. H. Swanson, *Gen. Supt*..........Houston, Tex.
E. S. Larchar, *Pur. Agt*........New York, N. Y.
L. C. Noble, *Gen. M. M*...........Houston, Tex.
James McGee, *M. C. B*..........Houston, Tex.
So. & Wn. Divs.: M. G. Howe, *Supt.*Houston, Tex.
No. & Mi. Divs.: G. A. Quinlan, *Supt.*Dallas, Tex.
C. H. Burns, *Asst. M. M*.....Corsicana, Tex.
No.-Wn. Div.: Donald Allen, *Supt*.... Waco, Tex.
Humeston & Shenandoah R. R.
4-8½ g. 85 m. 5 lo. 72 cars.
F. O. Wyatt, *Gen. Man*..........Clarinda, Ia.
M. B. Snyder, *M. M*..........Clarinda, Ia.
Huntingdon & Br. Top Mt. 4-8½ g. 62 m. 18 lo. 69 c.
Geo. F. Gage, *Gen. Supt*..........Huntingdon, Pa.
Samuel B. Knight, *Pur. Agt*..Philadelphia, Pa.
William Barkla, *M. M*..........Saxton, Pa.

I

Illinois Central R. R. 4-8½ g. 1,554 m. 224 lo. 6,172 c
Jas. C. Clark, *Gen. Man*.......... Chicago, Ill
E. T. Jeffery, *Gen. Supt*.......... Chicago, Ill
C. A. Beck, *Asst. Gen. Supt*........Chicago, Ill
O. Ott, *Pur. Agt*..........Chicago, Ill
Henry Schlacks, *S. of Mach*.......Chicago, Ill.
W. B. Snow, *M. M. Car Works*.....Chicago, Ill.
Chic. Div.: T. J. Hudson, *Supt*.......Cairo, Ill.
Wm. Renshaw, *Act. M. M*.......Chicago, Ill.
Mid. Div.: H. L. Frisbie, *Supt*.......Pontiac, Ill.
Spring. Div.: W. Wilkinson, *Supt.*Springfield, Ill.
W. B. McKenna, *M. M*..........Clinton, Ill.
No'n Div.: J. C. Jacobs, *Supt*..........Amboy, Ill.
J. B. Edams, *M. M*..........Amboy, Ill.
So. Div.: David Oxley, *M. M*...... Centralia, Ill.
Ia. Div.: M. Gilleas, *Supt*.......... Dubuque, Ia.
Thos. W. Place, *M. M*..........Waterloo, Ia.
Illinois Midland Ry. 4-8½ g. 176 m. 12 lo. 611 cars.
D. H. Conklin, *Rec. & Gen. Man*......Decatur, Ill.
O. E. Grady, *Train Mast*...........Decatur, Ill.
Frank Young, *For. Shops*.............Paris, Ill.
Illinois & St. Louis R. R. 4-8½ g. 18 m. 5 lo. 402 c.
Tho. McKissock, *Gen. Man*.......Belleville, Ill.
C. H. Sharman, *Gen. Supt. & P. A*.Belleville, Ill.
W. O. Hewitt, *M. M*..........Belleville, Ill.
Charles Rotha, *M. C. B*.......... E. St. Louis Ill.
Indiana, Bloomington & Western Ry.
4-8¾ g. 712 m. 64 lo. 3,650 cars.
C. E. Henderson, *Gen. Man*. Indianapolis, Ind.
J. H. Wilson, *Gen. Supt*.....Indianapolis, Ind.
H. C. Norton, *Pur. Agt*...... Indianapolis, Ind.
B. Warren, *Gen. M. M*.........Indianapolis, Ind.
Peoria Div.: I. H. Wilson, *Supt*..Indianapolis, Ind.
E. Hiserodt, *M. M*.......... Urbana, Ill.
St. Louis Div.: I. H. Wilson, *Supt*.....Indnpls, Ind.
John King, *M. M*............Indianapolis, Ind.
Ohio Div.: D. R. Ennis, *Asst. Supt.*Springfield, Ill.
Jos. S. Porter, *M. M*.............Sandusky, O.
Indiana, Illinois & Iowa R. R. 63 miles.
F. M. Drake, *Gen. Man*.......... Kankakee, Ill
J. P. Shonts, *Supt*.......... Kankakee, Ill.
Indianapolis & Vincennes R. R. (*See Penna. Co.*)
Intercolonial Ry. 4-8½ g. 846 m. 135 lo. 4,500 cars.
David Pottinger, *Chief Supt*.....Moncton, N. B.
T. V. Cooke, *Gen. Storekeeper*..Moncton, N. B.
H. A. Whitney, *Mech Supt*......Moncton, N. B.
Ewd. Shaffer, *M. C. B*.......... Moncton, N. B.
Monc. Div.: J. E. Price, *Supt*..Cambellton, N. B.
Hal. & St. J. Div.: Jas. Coleman, *Supt*..Truro, N. B.
Levis Div.: A. McDonald, *Supt.*Rivière du Loup, Q.
International Ry. 4-8½ g. 69 m. 2 lo. 12 cars.
D. E. McFee, *Supt*............Sherbrooke, Que.
International & Gt. N'n R. R. (*See Mo. Pac. Ry.*)
Iron Mountain & Helena R. R. 4-8½ g. 27 m. 2 lo. 11 c.
Wm. Bailey, *Pres. & Gen. Man*....Helena, Ark.
D. Stillinger, *Supt*.................Helena, Ark.
F. M. Green, *Pur. Agt*..........Helena, Ark
Wm. Summers, *M. C. B*...........Helena, Ark
Ithaca, Auburn & Western Ry. 4-8½ g. 38 m.
Fred T. Peet, *Supt*..........Auburn, N. Y.
Ira Dunning, *M. M*. ....Auburn, N. Y.

J

Jacksonville So.-E'n R. R. 4-8½ g. 54 m. 5 lo. 68 c.
E. S. Greenleaf, *Supt*..........Jacksonville, Ill.
Ira Petrie, *M. M*..........Jacksonville, Ill.
Jacksonv., Pensacola & Mob. (*See Fla. Cent. & W.*)
Jamesville & Washington. 4-8½ g. 22 m. 3 lo. 24 c.
A. Fisher, *Manager*..........Dymond City, N. C.
J. E. Lordley, *M. M. & C. B*..Dymond City, N. C.
Jeffersonv'l, Madison & Indpls. R. R. (*See Pa. Co.*)
Jersey City & Albany R. R. 4-8½ g. 38 m.
J. W. McCulloh, *Manager*...Jersey City, N. J.
Junction & Breakwater; Breakwater & Frankford; and Worcester R. Rs. 4-8½ g. 101 m. 6 l. 133 c.
J. & B. Rd.: Thos. Groome, *Supt*.... Lewes, Del.
Geo. Messick, *M M*..........Lewes, Del.
W. H. Virden, *M. C. B*..........Lewes, Del.
B. & F. and W. Rds.: J. L. Mapes, *St.*Berlin, Md.

K

Kansas Central R. R. (*See Union Pacific.*)
Kansas Cy, Lawrence & So. Kan. 4-8½ g. 396 m. 787 c.
C. C. Wheeler, *Gen. Man*..... . Topeka, Kan.
J. L. Barnes, *Supt*............Lawrence, Kan.
F. M. Smith, *Pur. Agt*. ....Topeka, Kan.
T. D. Volk, *M. M*..........Ottawa, Kan.
Kansas City, Fort Scott & Gulf R. R. 4-8½ g.
Geo. H. Nettleton, *Gen. Man*..Kansas City, Mo.
L. W. Towne, *Gen. Supt*..... Kansas City, Mo.
H. P. Jacques, *Pur. Agt*.. .. Kansas City, Mo.
J. S. McCrum, *M. M*..........Kansas City, Mo.
A. N. Montier, *M. C. B*..........Kansas City, Mo.
Kansas City, St. Joseph & Council Bluffs; and St. Jo. & Des Moines R. Rs. 4-8½ g. 368 m. 38 lo. 1,148 cars.
J. F. Barnard, *Gen. Supt. & P. A.*St. Joseph, Mo.
F. A. Chase, *M. M*.......... St. Joseph, Mo.
Thos. Aylesbury, *G. For. Car. Dep.*St. Joseph, Mo.
Kendall & Eldred R. R. (*See Olean, B. & W.*)
Kent Co.: Sm. & Del. Bay Rds. 4-8½ g. 50 m. 2 lo. 13 c.
Fred Gerker, *Gen. Man*.......Chestertown, Md.
Kentucky Central R. R. 4-9 g. 150 m. 20 lo. 598 cars.
G. W. Bender, *Supt*..........Covington, Ky.
A. H. Watts, *F. of Mach*. ......Covington, Ky.
J. L. Hackathorn, *M. C. B*.......Covington, Ky.
Kentucky & South Atlantic Ry. 3 g. 23 m. 3 lo. 52 c.
Geo. B. Harper, *Supt. & P. A*..Mt. Sterling, Ky.
S. P. Hatfield, *M. M*..........Mt. Sterling, Ky.
Kinzua R. R. (*See Olean, B. & W.*)
Kingston & Pembroke Ry. 4-8½ g. 65 m. 4 lo. 76 c.
B. W. Folger, *Supt*..........Kingston, Ont.
C. Gildersleeve, *Pur. Agt*........Kingston, Ont.
Geo. Becker, *M. M*..........Kingston, Ont.
Knox & Lincoln R. R. 4-8½ g. 49 m. 5 lo. 95 cars.
C. A. Coombs, *Supt*..........Bath, Me.
Wm. A. Field, *M. M*.......... Bath, Me.
C. L. Turner, *M. C. B*..........Bath, Me.
Knoxville & Augusta R. R. 4-6 g. 16 m. 2 lo. 34 cars.
J. M. Hood, *Supt*..........Knoxville, Tenn.
M. R. Hood, *Pur. Agt*.......... Knoxville, Tenn.

L

Lake Erie & Western Ry. 4-8½ g. 388 m. 43 lo. 1,526 c.
E. H. Waldron, *Gen. Man*......La Fayette, Ind.
E. H. Andress, *Pur. Agt*.......La Fayette Ind.
H. L. Cooper, *Supt. of Equipment*....Lima, O.
D. S. Hill, *Gen. Supt*.......... Sandusky, O
Lake Shore & Michigan So'n Ry.
4-8½ g. 1,243 m. 546 lo. 17,115 cars.
John Newell, *Gen. Man*..........Cleveland, O.
P. P. Wright, *Gen. Supt*..........Cleveland, O
A. C. Armstrong, *Pur. Agt*........Cleveland, O
James Sedgley, *Gen. M. M*........Cleveland, O.
John Kirby, *Gen. M. C. B*.........Cleveland, O.
Buffalo Div.: C. B. Couch, *Supt*.....Cleveland, O.
J. S. Graham, *M. M*.......... Buffalo, N. Y.
A. C. Robson, *M. C. B*.......... Buffalo, N. Y.
Frank. Div.: G. H. McIntire, *Supt*..Stoneboro, Pa.
Erie Div.: C. B. Couch, *Supt*........ Cleveland, O.
L. O. Gassett, *M. M*..........Cleveland, O.
J. Withycombe, *M. C. B*..........Cleveland, O.
Toledo Div.: Thos. Flesher, Jr., *Supt.*Cleveland, O.
J. M. Sanborn, *M. M*..........Norwalk, O.
W. O. Smith, *M. C. B*..........Norwalk, O.
Mich. Div.: J. E. Curtis, *Supt*.......... Toledo, O.
Det. Div.: T. J. Charlesworth, *Supt*. Detroit, Mich.
Lansing Div.: W. H. Caniff, *Supt*..Lansing, Mich.
Western Div.: A. G. Amsden, *Supt*...Chicago, Ill.
G. W. Stevens, *M. M*. (M. S. Divs.). Elkhart, Ind.
Frank O. Bray, *M. C. B*.........Adrian, Mich.
Ft. Wayne Br: W. H. Caniff, *Supt.*Jackson, Mich.
Kalamazoo Div.:
M. E. Wattles, *Supt*........Kalamazoo, Mich.
Lebanon Springs R. R. 4-8½ g.
W. C. Alstyne, *Manager*.. . Albany, N. Y.
J. K. Hotaling, *Pur. Agt*.......... Albany, N. Y.
Geo. Tefft, *M. M*.......... Chatham, N. Y.
Lehigh Valley R. R. 4-8½ g. 545 m. 321 lo. 33,817 c.
H. S. Goodwin, *Gen. Supt*.......Bethlehem, Pa.
L. Chamberlain, *Pur. Agt*.... Philadelphia, Pa.
John S. Lentz, *M. C. B*.......... Packerton, Pa.
N. J. Div.: Jas. Donnelly, *Supt.*Perth Amboy, N. J.
John I. Kinsey, *M. M*..........So. Easton, Pa.
Coal Rds.: J. I. Blakeslee, *Supt.*Mauch Chunk, Pa.
P. Hofecker, *M. M*..........Weatherly, Pa.
John Campbell, *M. M*.......... Delano, Pa.
B. M. Div.: A. G. Brodhead, *S.*..Mauch Chunk, Pa.
D. Clark, *M. M*..........Hazleton, Pa.
Wy. Div.: A. Mitchell, *S. & M. M.*Wilkesbarre, Pa.
Pa. & N. Y.; and Geneva, Ithaca & Sayre R. Rs.
Wm. Stevenson, *Supt*..........Sayre, Pa.
J. N. Weaver, *M. M*..........Waverley, Pa.
Lehigh & Hudson. 4-8½ g. 63 m. 8 lo. 350 cars
Grinnel Burt, *Gen Man*.......... Warwick, N. Y.
John Sayre, *Pur. Agt*..........Warwick, N. Y
S. Mills, *M. M*..........Warwick, N. Y.
Ligonier Valley R. R. 4-9 g. 11 m. 2 lo. 22 cars.
Thos. A. Mellon, *Gen. Manager*.. Pittsburg, Pa.
Geo. Senft, *Supt. & P. Agt*........Latrobe, Pa.
Little Rock, Miss. River & Texas Ry.
4-8½ g. 160 m. 12 lo. 260 cars.
J. A. Woodson, *G. S. & P. A*. Little Rock, Ark.
F. Hufsmith, *M. M. & C. B*. .Arkansas City, Ark.
Little Rock & Fort Smith. 4-8½ g. 168 m. 12 lo. 353 c
T. Hartman, *Gen. Supt*..........Little Rock, Ark.
James Eblin, *M. M*..........Argenta, Ark
James Malone, *M. C. B*..........Argenta, Ark.
Long Island R. R. 4-8½ g. 325 m. 79 lo. 740 cars.
I. D. Barton, *Supt*..... .Long Island City, N. Y.
Benj. Norton, *Pur. Agt*..Long Island City, N. Y.
C. A. Thompson, *M. M. & C. B*. do.
Louis., Evans. & St. L. Ry. 4-8½ g. 254 m. 24 lo. 1,032 c.
Webster Snyder, *Gen. Man*......Louisville, Ky.
W. H. Field, *Pur. Agt*..........Louisville, Ky.
F. M. Mast, *M. M*..........Evansville, Ind.
Louisville, New Albany & Chicago Ry.
4-8½ g. 470 miles 56 lo. 3,700 cars.
John MacLeod, *Gen. Supt*.......Louisville, Ky.
G. C. Breed, *Pur. Agt*.......... Louisville, Ky.
Josiah Bettis, *M. M. & C. B*...New Albany, Ind.
Louisville & Nashville R. R.
5 g. 2,090 m. 367 lo. 11,353 cars.
Milton H. Smith, *Gen Man*.......Louisville, Ky.
P. P. Huston, *Pur. Agt*..........Louisville, Ky.
D. W. C. Rowland, *Gen. Supt. Trans.*Louisville, Ky
Reuben Wells, *Supt. Mach*..... Louisville, Ky
Louisv. Divs.; and Louisv., Cin. & Lex. Ry. (Cin. Div.)
J. G. Metcalf, *Supt. Trans*..... Louisville, Ky.
P. Leeds, *M. M*. (Lo. Div.). .... Louisville, Ky.
J. W. Luttrell, *M. M*. (Cin. Div.). Louisville, Ky.
W. P. Pike, *M. M.* (2d & C. Div.). Bowling Green, Ky.
Henderson Div.: L. Hege, *Supt*...Henderson, Ky.
Nash. & D. Div.: J. Geddes, *Supt.*Nashville, Tenn.
W. H. Thomas, *M. M*..........Nashville, Tenn.
S. & N. A. Div.: E. Marsh, *Supt.*Birmingham, Ala.
C. W. White, *M. M*. ......Birmingham, Ala.
Mob. & M.; N. Div. Pens. & Sel.; Sl. & Mont. R. Rs.:
M. S. Belknap, *Supt*..........Montgomery, Ala.
J. N. Hall, *M. M.* (Mont. Shops). Montgomery, Ala.
N. O. Div.: J. T. Harrihan, *Supt.*New Orleans, La.
Wm. Adair, *M. M*.......... Mobile, Ala.
Memp. Div.: W. Colcamp, *Supt.*Memphis, Tenn.
J. V. Slusser, *M. M*.......... Memphis, Tenn.
St. L. Div.: J. Montgomery, *Supt*. Evansville, Ind.
Thos. Walsh, *M. M*..........Mt. Vernon, Ill.
Pensacola and So. Div. Pens. & Selma Rds.:
E. O. Saltmarsh, *Supt*..........Pensacola, Fla.
R. B. Small, *M. M*..........Pensacola, Fla.
Louisville & Wadley R. R. 5 g. 10 m.
J. H. Wilkins, *Pr. & Supt*.....Louisville, Ga

M

Maine Central R. R. 4-8½ g. 470 m. 58 lo. 1,335 c.
Gen. Supt........Portland, Me
Ira K. Russell, *M. M*.......... Waterville, Me.
C. H. Kenison, *M. C. B*..........Augusta, Me.
Manchester & Keene R. R. (*See B. L. & C.*)
B. F. George, *Asst. Supt*..........Keene, N. H.
Manhattan Ry. 4-8½ g. 32 m. 203 lo. 596 pass. c.
Frank K. Hain, *Gen. Man*.....New York, N. Y.
C. L. Green, *Supt*..........New York, N. Y
T. W. Peeples, *M. M*..........New York, N. Y.
H. A. Webster, *M. C. B*........New York, N. Y.
Marietta & North Georgia R. R. 3 g. 24 m. 1 lo. 5 c.
J. B. Glover, *Supt. & P. Agt*.. ...Marietta, Ga.
E. A. Withers, *M. M*..........Marietta, Ga.
Marquette, Houghton & Ontonagon R. R.
4-8½ g 87 m. 30 lo. 2,074 cars.
Samuel Schoch, *Gen. Man*.....Marquette, Mich.
M. B. McGee, *Pur. Agt*.......Marquette, Mich.
W. H. Williams, *M. M*........Marquette, Mich.
H. D. Lyons, *M. C. B*..........Marquette, Mich.
Massachusetts Central R. R. 4-8½ g. 48 m.
E. G. Allen, *Supt. & P. A*.........Boston, Mass.
Memphis & Charleston R. R. (*See E. Tenn. Va. & Ga.*.
Memphis & Lit. Rock R. R. 5 g. 135 m. 14 lo. 272 c.
E. K. Sibley, *G. Man. & P. A*..Little Rock, Ark.
H. G. Fleming, *Supt*..........Memphis, Tenn.
Thos. Rennell, *M. M*..........Argenta, Ark.
P. Twitchell, *M. C. B*..........Argenta, Ark.
Mexican Central Ry.
Howard Hinckley, *Pur. Agt*. .Boston, Mass.
Main Line:
Rudolph Fink, *Gen. Man*..... City of Mexico
J. H. Garner, *Supt. Trans*....City of Mexico.
F. W. Johnson, *M. M*.........City of Mexico.
J. H. O'Brien, *M. C. B*........City of Mexico.
Chihuahua Div.:
D. B. Robinson, *G Supt*. El Paso del Norte, Mex.
J. N. Lauder, *Supt. R. S.*.El Paso del Norte, Mex.
Tampico Div.:
Edward A. Whorf, *Supt*......Tampico, Mex.
Mexican National Ry. (*See Tex.-Mex.*)
Michigan Cen. R. R. 4-8½ g. 1,013 m. 266 lo. 8,000 c.
H. B. Ledyard, *Gen. Man*........Detroit, Mich.
E. C. Brown, *Gen. Supt*..........Detroit, Mich.
W. P. Taylor, *Gen. Supt*.........Buffalo, N. Y.
Allan Bourn, *Pur. Agt*..........Detroit, Mich.
S. H. Edgerly, *Gen. M. M*..........Jackson, Mich.
Robert Miller, *Gen. M. C. B*..........Detroit, Mich.
East. Div.: D. S. Sutherland, *Supt.*Detroit, Mich.
Bay City, Saginaw & Mackinaw Divisions.:
W. A. Vaughan, *Supt*.........Bay City, Mich.
C. E. Smart, *M. M*............Bay City, Mich.
Main Line: Gr. Rap.; So. Bend; and So. Hav. Divs.:
C. B. Bush, *Supt*.......... Jackson, Mich.
W'n Divs.: R. H. L'Hommedieu, *Supt.*Chicago, Ill.
Middleburg & Schoharie; and
Schoharie Valley R. Rs. 4-8½ g. 10 m. 2 lo. 4 cars
S. S. Danforth, *Gen. Supt*... Middleburg, N. Y.
Midland of Canada. 4-8½ g. 143 m. 12 lo. 503 cars.
Geo. A. Cox, *Gen. Man*.....Peterborough, Ont.
W. B. Ferguson, *Gen. Supt.*Peterborough, Ont.
C. H. Crofts, *Storekeeper*...Peterborough, Ont.
J. Haggas, *Mech. Supt*..........Port Hope, Ont.
Edward Douglas, *M. C. B*......Port Hope, Ont.
H. Harry, *M. C. B*................Lindsay, Ont.
Toronto & Nipissing Div. 3-6 g. 105 m. 12 lo. 211 c.
J. Haggas, *M. M*.......... Uxbridge, Ont.
Chas. E. Caron, *M. C. B*.......Uxbridge, Ont.
Midland No. Car. Ry. 5 g. 95 m. 9 lo. 82 cars.
J. W. Andrews, *Gen. Man*..... Newbern, N. C.
Jno. P. Caddagan, *Pur. Agt*....Newbern, N. C.
J. W. Andrews, *Supt*...........Goldsboro, N. C.
B. Manly, *Supt. of Mach*........Newbern, N. C.
Milwaukee, Lake Shore & Western Ry.
4-8½ g. 322 m. 40 lo. 1,536 cars.
H. G. H. Reed, *Gen. Man. & P. Agt.*Milwaukee, Wis
J. Donahue, *Supt*..........Milwaukee, Wis.
Chas. S. Hayden, *Asst. Supt*...Manitowoc, Wis
David B. Curtis, *Asst. Supt*.. Oshkosh, Wis
John Hickey, *M. M*..........Manitowoc, Wis
Milwaukee & Northern.
C F. Dutton, *Gen. Supt*.......Milwaukee, Wis.
N. S. Kimball, *M. M*............Green Bay, Wis.
Mineral Range R. R. 3 g. 13 m. 4 lo. 42 cars.
Chas. E. Holland, *Pr. & Supt*...Hancock, Mich.
W. H. Carr, *Pur. Agt*..........Hancock, Mich.
T. J. Shellhorn, *M. M. & C. B*..Hancock, Mich.
Minneapolis & St. L. Ry. 4-8½ g. 506 m. 60 lo. 1,850 c.
Gen. Man......Minneapolis, Minn.
E. Ryder, *Gen. Supt. & Pur. Agt*. Min'p's, Minn.
Geo. F. Wilson, *Supt. of M*..Minneapolis, Minn.
Mississippi & Tenn. R. R. 4-8½ g. 101 m. 11 lo. 194 c.
M. Burke, *Gen. Supt*..........Memphis, Tenn.
J. C. Ramsey, *M. M*..........Memphis, Tenn.
S. J. Bolton, *M. C. B*............Memphis, Tenn.
Missouri Pacific Ry. (Leased and operated lines.)
4-8½ g. 5,879 m. 682 lo. 19,648 cars.
A. A. Talmage, *Gen. Man*........St. Louis, Mo.
R. B. Lyle, *Pur. Agt*..........St. Louis, Mo.
(1)Missouri Pac. Ry. 4-8½ g. 2,708 m. 324 lo. 10,000 c.
John Hewitt, *Supt. Mach*.........St. Louis, Mo.
John Hodge, *Supt Car Dep*.......St. Louis, Mo.
Main Line, Warder Cumming, *Supt*..Sedalia, Mo.
C. L. Dunham, *Supt*. W'n Div., Kansas City, Mo.
Le Roy Bartlett, *Asst. M. M*....St. Louis, Mo
Geo. Walshe, *M. M*. .Sedalia, Mo
M., K. & Tex. Div., J. M. Eddy, *Supt.*Sedalia, Mo.
J. C. Barber, *Asst Supt. Car Dep.*Sedalia, Mo.
J. W. Haines, *M. M*.......... Parsons, Kan
Cen. Br. Div., W. W. Fagan, *Supt* Atchison, Kan
H. V. Faries, *M. M*..........Atchison, Kan
S. Irvin, *Asst. Supt. Car Dep*. .Atchison, Kan

(1) St. L., I. M. & So. 4–8½ g. 859 m. 141 lo. 4,860 c.
Wm. Kerrigan, *Supt*...............Louis, Mo.
O. A. Haynes, *S. M. P. & M*..........De Soto, Mo.
St. Louis Div.: W. H. Harris, *M. M*..De Soto, Mo.
Ark. Div.: R.M. Richardson, *M. M.* Little Rock, Ark.
H. H. Sessions, *M. C. B*..........Marshall, Tex.
(2) Texas & Pac. 4–8½ g. 1,487 m. 144 lo. 3,076 c.
E. L. Dudley, *Supt*..............Marshall, Tex.
O. A. Haynes, *S. M. P. & M*......Marshall, Tex.
New Or. Div.: J. T. Whedon, *Supt.* Gouldsboro, La.
Perry Stevens, *M. M*..............Marshall, Tex.
Eastern Div.: J. Williams, *Supt*..Longview, Tex.
Rio Gr. Div.: G. O. Clinton, *Supt.* Big Springs, Tex.
Wm. Foley, *M. M*..........Big Springs, Tex.
(3) Int. & G. North. 4–8½ g. 776 m. 73 lo. 1,712 c.
Jos. Harrin, *Supt*.............Palestine, Tex.
O. A. Haynes, *S. M. P. & M*....Palestine, Tex.
O. H. Johnson, *M. M*...........Palestine, Tex.
Mobile & Ala. Grand Trunk R. R. 5 g. 59 m. 2 lo. 23 c.
Wm. H. Pratt, *Trustee*..............Mobile, Ala.
Mobile & Girard R. R. 5 g. 84 m. 7 lo. 112 cars.
W. L. Clark, *Gen Supt*..........Columbus, Ga.
J. C. Albrecht, *M. M*.............Columbus, Ga.
A. J. Nix, *M. C. B*................Columbus, Ga.
Mobile & Ohio R. R. 5 g. 528 m. 75 lo. 1,353 cars.
A. L. Rives, *V.-Pr. & Gen. Man*....Mobile, Ala.
R. H. Briggs, *Gen. M. M*..........Whistler, Ala.
J. T. Booth, *M. C. B*..............Whistler, Ala.
So'n Div., I. G. Motley, *Supt*.........Mobile, Ala.
John Fitzgerald, *M. M*...........Macon, Miss.
No'n Div.: E. S. Horsford, *Supt*. Jackson, Tenn.
M. T. Carson, *M. M*..............Jackson, Tenn.
Mobile & Spring Hill R. R. 5 g. 8 m. 10 lo. 90 cars.
F. Ingate, *Supt*......................Mobile, Ala.
Mont Alto R. R. 4–9 g. 21 m. 2 lo. 3 cars.
G. B. Weistling, *Supt. & P. A*....Mont Alto, Pa.
Montpelier & Wells Riv. R. R. 4–8½ g. 38 m. 3 lo. 76c.
Supt..............Montpelier, Vt.
Morgan's Louisiana & Tex. R. R. 4–8½ g. 165 m.
Supt.......New Orleans, La.
C. Trumpy, *Pur. Agt*.......New Orleans, La.
N. Tilton, *M. M*.......................Algiers, La.
Wm. O'Brien, *M. C. B*...............Algiers, La.
Muncy Creek Ry. 4–8½ g. 10 m.
Benj. G. Welch, *Rec. & P. Agt.* Hughesville, Pa.
J. V. Chamberlain, *Supt. & M. M.* do.

N

Nashville, Chattanooga & St. Louis R'y.,
5 g. 508 miles 87 lo. 1,979 cars.
J. W. Thomas, *G. Supt. & P. Agt.* Nashville, Tenn.
M. J. C. Wrenne, *Supt*.........Nashville, Tenn.
James Cullen, *M. M. & C. B*. .Nashville, Tenn.
Natchez, Jackson & Col. R. R. 3–6 g. 98 m. 7 lo. 72 c.
E. G. Frost, *Gen. Supt*.......... Natchez, Miss.
Naugatuck R. R., 4–8½ g. 61 miles, 14 lo. 384 cars.
Geo. W. Beach, *Supt*..............Waterbury, Ct.
Henry Hanford, *M. M*.............Bridgeport, Ct.
Geo. W. Gray, *M. C. B*............Bridgeport, Ct.
Nevada Central R. R. (*See Union Pac.*)
Nevada County N. G. R. R. 3 g. 23 m. 3 lo. 46 cars.
John F. Kidder, *Supt*..........Grass Valley, Cal.
Jas. McCormick, *M. M. & C. B.* Grass Valley, Cal.
New Brunswick Ry. 4–8½ g. 194 m. 12 lo. 266 cars.
E. R. Burpee, *Gen. Man*............Gibson, N. B.
Henry Osborn, *Gen. Supt*.........Gibson, N. B.
Alfred Seely, *Pur. Agt*..............Gibson, N. B.
Jesse Mathews, *M. M*...............Gibson, N. B.
T. N. Burpee, *M. C. B*.............Gibson, N. B.
New Brunswick & Can. Ry. 4–8½ g. 127 m. 12 lo. 184c.
Henry Osborn, *G. M. & P. A.* St. Andrew's, N. B.
John Stewart, *Supt*..........St. Stephen, N. B.
Thos. Armstrong, *M. M*.... St. Andrew's, N. B.
G. Houlton, *M. C. B*........St. Andrew's, N. B.
New Haven & Derby R. R. 4–8½ g. 13 m. 3 lo. 58 c.
E. S. Quintard, *Supt*..........New Haven, Conn.
J. M. Whitlock, *M. M. & C. B.* New Haven, Conn.
New Haven & No'mpton. 4–8½ g. 135 m. 26 lo. 572 c.
C. A. Goodnow, *Supt*........ New Haven, Ct.
C. N. Yeamans, *Pur. Agt*........New Haven, Ct.
Henry Fox, *M. M*.................New Haven, Ct.
John Sweeny, *M. C. B*...........New Haven, Ct.
New Jersey & New York Ry. 4–6 g. 43 m. 6 lo. 40 c.
J. D. Hasbrouck, *Gen. Man* Jersey City, N. J.
J. S. Drake, *Supt. & M. M*.......Hillsdale, N. J.
L. B. Van Wagonen, *M. C. B*....Hillsdale, N. J.
New Jersey Southern Ry. (*See Central, N. J.*)
New London Northern R. R (*See Central Ver.*)
New Orleans Pacific Ry. 5 g. 85 m. 10 lo. 206 cars.
H. S. Morse, *Supt*..............New Orleans, La.
E. R. Smith, *M. M. & C. B*....New Orleans, La.
N. Y. Central & Hudson River R.R.
4–8½ g. 962 m. 676 lo. 22 539 cars.
J. M. Toucey, *Gen. Supt*...... New York, N. Y.
R. C. Moore, *Pur. Agt*......... New York, N. Y.
Wm. Buchanan, *Supt. M. P*... New York, N. Y.
L. Garey, *Supt. Car Dept*...... New York, N. Y.
N. Y. & Har. Div.: C. M. Bissell, *Supt*. do.
P. McQ. Gibson, *M. M*.........New York, N. Y.
C. E. Garey, *M. C. B*..........Morrisania, N. Y.
Hud. Riv. Div.: C. M. Bissell, *Supt.* N. York, N. Y.
Peter Smith, *M. C. B*............New York, N. Y.
E'n Div.: Zenas C. Priest, *Supt*.......Utica, N. Y.
G. B. Van Vorst, *M. M*....West Albany, N. Y.
D. Hoit, *M. C. B*......... West Albany, N. Y.
W'n Div.: Geo. H. Burrows, *Supt.* Rochester, N. Y.
S. L. White, *M. M*............Syracuse, N. Y.
Amos Gould, *M. M*...........E. Buffalo, N. Y.
E. A. Olmstead, *M. C. B*....E. Buffalo, N. Y.
C. H. Burchard, *M. C. B*..E. Rochester, N. Y.
Rd. Donaby, *M. C. B*....Niagara Falls, N. Y.
N. Y. Chic. & St. L. Ry. 4–8½ g. 269 m. 115 lo. 4,838 c.
Lewis Williams, *Gen. Man*...... Cleveland, O.
Gen. Supt.......Cleveland, O.
Jno. W. Dougherty, *Pur. Agt*. ....Cleveland, O.
Jno. Mackenzie, *Supt. M. P*. .....Cleveland, O.
Eas'tn Div.: G. H. Kimball, *Supt*...Cleveland, O.
E. A. Miller, *M. M*..............Conneaut, O.
West'n Div.: A. H. Evans, *Act. Supt*..Chicago, Ill.
Jas. Eckford, *M. M*..............Bellevue, O.
New York City & Northern. 4–8½ g. 52 m. 7 lo. 91 c.
Frank S. Gannon, *Gen. Supt.* High Bridge, N. Y.
Theo. Wheeler, *M. M*........High Bridge, N. Y.
New York, Lake Erie & Western R. R.
4–8½ g. 1,020 m. 568 loco. 30,500 cars.
Robt. Harris, *V. Pr. & G. Man.* New York, N.Y.
E. S. Bowen, *Gen. Supt*........New York, N. Y.
J. A. Hardenburg, *Pur. Agt*..New York, N. Y.
F. M. Wilder, *Supt. M. P. & M*...Susqueh'a, Pa.
E'n Div.: E. O. Hill, *Supt*.....Jersey City, N. J.
J. H. Vreeland, *M. M*...... Jersey City, N. J.
J. N. Mileham, *M. C. B*.....Jersey City, N. J.
Del. Div.: W. J. Murphy, *Supt*..Port Jervis, N. Y.
J. Van Vechten, *M. M. & C. B.* Pt. Jervis, N. Y.
Susq. Div.: I. Jolls, *Supt*..........Elmira, N. Y.
V. Blackburn, *M. M*........Susquehanna, Pa.
D. B. Goodell, *M. C. B*..........Elmira, N. Y.
Buf. & R. Divs.: Chas. Neilson, *Supt.*; and
G. B. Ross, *M. M*.................Buffalo, N. Y.
M. Wilder, *M. C. B*..............Buffalo, N. Y.
B. & S.-W. Div.: C. A. Brunn, *Supt* do.
W'n Div.: W. B. Coffin, *Supt*..Hornellsville, N. Y.
R. Gunn, *M. M*...........Hornellsville, N. Y.
New York, New Haven & Hartford R. R.
4–8½ g. 203 m. 123 lo. 2,768 cars.
E. M. Reed, *V. P. & Gen. Man*..New Haven, Ct.
R. N. Dowd, *Pur. Agt*............New Haven, Ct.
N. Y. & N. H. Div.: W.H. Stevenson, *Supt*...N. Y.
Shore Line Div.:
O. M. Shepard, *Supt*......... N. Haven, Ct.
Air Line Div.: O. M. Shepard *Supt.* N. Haven, Ct.
H. Kettendorf, *Supt. M. P*...New Haven, Ct.
Jas. Denver, *M. C. B*..........New Haven, Ct.
Hart. Div.: C. S. Davidson, *Supt*....Hartford, Ct.
John Henny, Jr., *Supt. M.P. & M. C. B*.... do.
New York, Ontario & Western Ry.
4–8½ g. 249 m. 79 lo. 1,539 cars.
Jas. E. Childs, *Gen. Supt*...... New York, N. Y.
I. W. Fowler, *Pur. Agt*......Middletown, N. Y.
Edw. Minshull, *M. M. & C. B.* Middletown, N. Y.
Mid. Div.: N. R. Hankins, *Supt.* Middletown, N. Y.
No'n Div.: C. W. Lanpher, *Supt*....Norwich, N. Y.
So. Div.: E. Canfield, *Supt*.........Tappan, N. Y.
New York, Pennsylvania & Ohio R. R.
4–8½ g. 564 m. 218 lo. 7,394 cars.
J. M. Ferris, *Gen. Man*..........Cleveland, Ohio
J. H. Holway, *Pur. Agt*..........Cleveland, Ohio.
Wm. Fuller, *Gen. M. M. & C. B*...Cleveland, O.
S. V. Smith, *Asst. Gen. M. C. B*.....Kent, Ohio.
E'n Div.: A. L. Dunbar, *Supt*........Meadville, Pa.
J. A. Cooper, *M. M*...............Meadville, Pa.
D. S. Dockstader, *M. C. Rep*...Meadville, Pa.
J. T. Fosdick, *For. Car Rep.* Salamanca, N. Y.
W'n Div.: J. W. Alsop, *Supt*........... Galion, O.
Wm Hill, *M. M*..........................Galion, O.
J. W. Holmes, *For. Car Rep*.......Galion, O.
Geo. Wilson, *For. Car Rep*.... Dayton, Ohio.
Maho'g Div.: N. F. Wood, *Supt*.......Cleveland, O.
N. Wright, *M. M*...................Cleveland, O.
C. N. Thorp, *M. C. Rep*..........Cleveland, O.
New York, Providence & Boston R. R.
4–8½ g. 72 m. 29 lo. 430 cars.
J. B. Gardner, *Supt*............Providence, R. I.
Giles F. Ward, *Pur. Agt*......Stonington, Conn.
J. H. Anderson, *M. M. & C. B.* Providence, R. I.
N. Y., Susquehanna & W'n. 4–9 g. 135 m. 28 lo. 925 c.
H. M. Britton, *Gen. M. & P. A.* New York, N. Y.
W. C. Ennis, *M. M. & C. B*...Wortendyke, N. J.
New York, West Shore & Buffalo Ry.
Chas. Paine, *Gen. Man*. ......New York, N. Y.
Howard Fry, *Supt. M. P*......New York, N. Y.
P. S. Bemis. *Pur. Agt*.........New York, N. Y.
Harry Linn, *M. M*.
Walkill Ry. G. H. Graves, *Supt*..Rondout, N. Y.
New York, Woodhaven & Rockaway R. R.
4–8½ g. 26 m. 8 lo. 101 cars.
J. M. Lunt, *Supt. & P. Agt*..Hunter's Pt., L. I.
W. B. Turner, *M. M*........Hunter's Point, L. I.
N. Y. & Greenwood Lake Ry. 4–8½ g. 44 m. 8 lo. 53 c.
Stephen Smith, *Supt*..........Jersey City, N. J.
J. A. Hardenburg, *Pur. Agt*...New York, N. Y.
G. A. Hill, *M. M*....................Pompton, N. J.
N. Y. & Manhattan Beach Ry. 3 g. 23 m. 12 lo. 128 c.
D. C. Corbin, *Man. Dir*.........New York, N. Y.
O. Fairhurst *M. M*...............Greenpoint, L. I.
New York & New England R. R.
4–8½ g. 463 m. 127 lo. 3,326 cars.
S. M. Felton, Jr., *Gen. Man*......Boston, Mass.
W. W. McKim, *Pur. Agt*..........Boston, Mass.
Ross Kells, *Supt. M. P*............Boston, Mass.
A. K. Mansfield, *Mech. Eng*. ....Boston, Mass.
D. P. Wright, *M. M*...............Norwood, Mass
H. E. Barker, *Gen. Fore*..........Norwood, Mass.
East Div: C. C. F. Bent, *Supt*......Boston, Mass.
W. G. Tabor, *M. M*...............Boston, Mass.
Nor. Div.: P. St. M. Andrews, *Supt*...Norwich, Ct.
W. A. Stone, *M. M*..............Norwich, Ct.
Prov. Div.: L. W. Palmer, *Supt*..Providence, R. I.
Hfd. Div.: E. Holbrook, *Supt*.......Hartford, Ct.
E. M. Humstone, *M. M*.........Hartford, Ct.
D. F. Andregg, *For. C. Dept*.....Hartford, Ct.
Newburg, Dutchess & Conn. R. R. 4–8½ g. 58 miles.
C. L. Kimball, *Gen. Supt*.....Matteawan, N. Y.
W. G. Van Buskirk, *M. M. & C. B.* do
Norfolk Southern. R. R. 4–8½ g. 79 m. 5 lo. 96 c.
M. K. King, *Gen. Man. & Pur. Agt.* Norfolk, Va.
J. S. Whitworth, *M. M. & C. B*....Norfolk, Va.
Norfolk & Western R. R. 5 g. 428 m. 82 lo. 1,220 c.
Henry Fink, *2d V. Pr. & Gen. Man.* Lynchb'g, Va.
W. C. De Armond, *Pur. Agt*...Philadelphia, Pa.
C. Blackwell, *Supt. M. P*.........Roanoke, Va.
West'n Div.: Frank Huger, *Supt*...Lynchburg, Va.
F. Sterk, *M. M*...................Lynchburg, Va.
East'n Div.: N.M. Osborne, *Supt*...Petersburg, Va.
J. T. Robinett, *M. M. & C. B*...Petersburg, Va.
North-Eastern R. R. of Ga. 5 g. 40 m. 2 lo. 18 cars.
H. R. Bernard, *Supt*.....................Athens, Ga.
North-Eastern R. R. (S. C.) (*See Wil. & Wel.*)
North Pacific Coast R. R. 3 g. 84 m. 12 lo. 320 cars.
David Nye, *Gen. Supt*..........San Rafael, Cal.
W. F. Russell, *Pur. Agt*....San Francisco, Cal.
J. Fowler, *M. M*...................Sancelito Cal.
North Shore
A. Davis, *Gen. Man*..................Quebec, Can.
Northern (N. H.), and Concord & Claremont Rys.
4–8½ g. 173 m. 25 lo. 569 cars.
Geo. E. Todd, *Supt*...............Concord, N. H.
M. M. & C. B. & Pur. Agt.. do.
Northern (N. J.) R. R. (*See N. Y., L. E. & W'n.*)
Northern Central Ry. (*See Penna. (R.R.)*
North'n Pacific R. R. 4–8½ g. 1,193 m. 104 lo. 3,089 c.
Herman Haupt, *Gen. Man*..... St. Paul, Minn.
John H. Ames, *Pur. Agt*.......St. Paul, Minn.
J. T. Odell, *Supt. Trans*.........St. Paul, Minn.
Geo. W. Cushing, *Supt. M. P., M. & R. S.* do.
W. T. Small, *Asst. S. M. P. & M.* do.
St. P. & Minn. Divs.: M. C. Kimberly, *Supt.*, do.
W. T. Small, *A. S. Mach.* (W.D.). Sprague, W. Ter.
Frank Howard, *M. C. B*......Brainerd, Minn.
Dakota Div.: J. M. Graham, *Supt*..Fargo, Dak.
A. Rupert, *M. M*..................Fargo, Dak.
Mo. Div.: D. R. Taylor, *Supt*...... Mandan, Dak.
E. F. Doran, *M. M*...............Mandan, Dak.
Yell'st'e Div.: S. R. Ainslie, *Supt.* Glendive, Mont
S. L. Bean, *M. M*...............Glendive, Mont.
G. S. La Rue, *M. M*...............Billings, Mont.
(2) Western Div.: J. M. Buckley, *A. G. M.*; and
Otis Sprague, *Supt*.......New Tacoma, W. T.
H. D. Sanborn, *Pur. Agt*......Portland, Ore.
W. T. Small, *A. S. Mach.* (W.D.) Sprague, W. T.
F. C. Ford, *M. M*..............New Tacoma, W. T.
S. Wishart, *M. C. B*......New Tacoma, W. T.
Pend d'Ore Div.:
F. F. Griffin, *Supt*,..........Ainsworth, W. T.
J. F. Curtis, *M. M*..............Sprague, W. T.
Northern & North-W'n Ry. 5–6 & 4–8½ g. 50 lo. 1,033 c.
James Webster, *Supt*..............Toronto, Can.
W. C. Schreeber, *Pur. Agt*.......Toronto, Can.
P. Clarke, *M. M*......................Toronto, Can.

O

Ogdensburg & Lake Champlain R. R.
4–8½ g. 122 m. 33 lo. 1,160 cars.
A. A. Gaddis, *Gen. Man*......Ogdensburg, N. Y,
Abr. Klohs, *Supt. & M. M*........Malone, N. Y.
Ohio Central R. R. 4–8½ g. 230 m. 45 lo. 4,760 cars.
John E. Martin, *Gen. Man*.......... Toledo, O.
T. M. Peeler, *Supt*......................Bucyrus, O.
F. W. Stewart, *Pur. Agt*..............Toledo, O.
J. B. Morgan, *M. M. & C. B*........Bucyrus, O.
Ohio Southern. 4–8½ g. 119 m. 19 lo. 623 cars.
D. R. Ennis, *Supt*.................Springfield, O.
H. C. Norton, *Pur. Agt*......Indianapolis, Ind.
W. B. Warren, *M. M*..............Springfield, O.
Ohio & Mississippi Ry. 4–9 g. 615 m. 112 lo. 2,501 cars.
W. W. Peabody, *Gen. Supt*.......Cincinnati, O.
G. E Atwood, *Pur. Agt*..........Cincinnati, O.
J. H. Setchel, *Gen. M. M*.........Cincinnati, O.
Cin. Div.: C. B. Cole, *Supt*.........Seymour, Ind.
John Thumser, *M. M*..........Seymour, Ind.
J. P. Coulter, *M. C. B*..............Aurora, Ind.
Arthur Donaldson, *M. M*......Vincennes, Ind.
St. L. & Sp. Div.: C. M. Stanton, *Supt.* St. Louis, Mo.
J. W. Stokes, *M. M.* (Spring. Div.)..Pana, Ill.
Louisv. Div.: C. B. Cole, *Supt*......Louisville, Ky.
Oil City & Chicago R. R. 4–9 g. 36 m. 6 lo. 50 cars.
A. Vandiwort, *Supt*..............New Castle, Pa.
Oil City & Ridgway R. R. 4–8½ g. 6 m. 1 lo. 43 cars.
A. F. Kent, *Gen. Man*...............Oil City, Pa.
Old Colony R. R. 4–8½ g. 463 m. 110 lo. 2,862 cars.
J. R. Kendrick, *Gen. Man*..........Boston, Mass.
Main Li. Div.: J. H. French, *Supt*...Boston, Mass.
R. W. Husted, *Pur. Agt*........... Boston, Mass.
J. K. Taylor, *M. M*................ Boston, Mass.
A. Gleason, *M. C. B*..................Boston, Mass.
Cape Cod Div.: C. H. Nye, *Supt*..Hyannis, Mass.
No. Div.: S. A. Webber, *Supt*....Fitchburg, Mass.
George W. Reynolds, *M. M*.......Taunton, Mass.
Sam. Stevens, *M. C. B*........... Taunton, Mass
Olean, Bradford & Warren: Bradford; Kinzua; and
Kendall & Eldred R. Rs. 3 g. 38 m. 9 lo. 222 cars.
J. W. Watson, *Gen. Supt*...........Olean, N. Y.
J. H. Poole, *Pur. Agt*..............Buffalo, N. Y.
Charles Turner, *M. M. & C. B*......Olean, N. Y.
Oregon Ry. & Nav. Co. 4 8–½ g. 225 m. 31 lo. 930 cars.
C. H. Prescott, *Manager*...........Portland, Ore.
R. E. O'Brien, *Asst. Man. & Act. Supt*. do.
K Von Oterendorf, *Supt.* (O. Div.) S. F'cisco, Cal.
H. S. Rowe, *Supt.* (Ry Div.)......Portland, Ore.
J. M. Drake, *Pur. Agt*............ Portland, Ore.
C. C. Hobart, *Gen. M. M*.........The Dalles, Ore.
Chas. A. Phipps, *M. C. B*..... The Dalles, Ore.
N. G. Div.: Wm. Reed, *Man*...... Portland, Ore.
James Walch, *M. M*.................Portland, Ore.
Oregon & California R. R. 4–8½ g. 200 m. 14 lo. 286 c.
R. Koehler, *Act. Man*...............Portland, Ore
J. Brandt, *Gen. Supt*...............Portland, Ore.
A. Brandt, *M. M*....................Portland, Ore.
Owensboro & Nashville R. R. 5 g. 44 m. 3 lo. 70 c.
R. S. Bevier, *Act. Supt*..........Owensboro, Ky.
H. M. Gabel, *M. M. & C. B*....Owensboro, Ky.

P

Pacific Coast Ry. 3 g. 11 m.
J. M. Fillmore, *Manager* San Luis Obispo, Cal.
W. H. Masterman, *M. M. & C. B*. do.
Painesville & Youngstown R. R. 3 g. 65 m. 7 lo. 319 c.
R. K. Paige, *Rec. & Man*.........Painesville, O.
J. A. Newcome, *Supt*............Painesville, O.
E. B. Baldwin, *M. M*............ Painesville O.
Panama R. R. 5 g. 58 m. 14 lo. 534 cars.
H. A. Woods, *Supt*......... Aspinwall, U. S. Col.
E. Z. Penfield, *Pur. Agt*.......New York, N. Y.
W. F. Ray, *M. M*...........Aspinwall, U. S. Col.
Parker & Karns City; and
Karns City & Butler R. Rs. 3 g. 27 m. 5 lo. 84 cars.
W. C. Moberly *Gen. Supt*...... Parker City, Pa.
Philip Davies, *M. M*............Parker City, Pa.
Wm. Wolford, *M. C. B*.........Parker City, Pa.
Passumpsic R. R. 4–8½ g. 145 m. 28 lo. 980 cars.
E. Raymond, *Pres. & Pur. Agt*..Boston, Mass.
H. E. Folsom, *Supt*............Lyndonville, Vt.
L. L. Brigham, *M. M*......... Lyndonville, Vt.
L. F. Woodard, *M. C. B*......Lyndonville, Vt.
Peach Bottom R. R. 3 g. 55 m. 6 lo. 52 cars.
Samuel Dickey, *Gen. Man*............York, Pa.
G. R. Dickey, *Supt. & Pur. Agt*......York, Pa.
E. H. Williams, *M. C. B*...............York, Pa.
E. Div.: S. Dickey, *Supt*..............Oxford, Pa.
W. P. Kirk, *M. M*..................Oxford, Pa.
Pennsylvania Co.'s (9) Roads.
4–9 g. 2,838 m. 817 lo. 29,432 cars.
Wm. Mullins, *Gen. Pur. Agt*......Pittsburg, Pa.
Joseph Wood, *Supt. M. P*..... .Fort Wayne, Ind.
(1) Clev. & Pittsb'g R. R. 4–9 g. 224 m. 97 lo. 3,336 c.
R. F. Smith, *Asst. Man*..........Cleveland, O.
Philip Bruner, *Supt*.............Wellsville, O.
W. F. Beardsley, *Mast. of Mach.* Wellsville, O.
(2 & 3) Erie & Ashtabula Rds. 178 m. 29 lo. 1,340 c.
John M. Kimball, *Supt*.......Youngstown, O.
J. A. Wood, *Gen. For. Shops*........Erie, Pa.
(4) Indianap. & Vincennes Rd. 117 m. 11 lo. 303 cars.
Jas. J. Turner, *Supt*........Indianapolis, Ind.
(5) Jeffersonville, Madison & Indianapolis R. R.
4–9 g. 217 m. 47 lo. 784 cars.
E. W. McKenna, *Supt*..........Louisville, Ky.
Wm. Swanston, *M. M*.....Jeffersonville, Ind.
Edw. Austin, *M. C. B*.....Jeffersonville, Ind.
(6) Northwestern Ohio Ry. 4–9 g. 79 m.
J. S. Morris, *Supt*...................Toledo, O.
(7) Pittsburg, Ft. Wayne & Chicago Ry.
4–9 g. 468 m. 278 lo. 6,782 cars.
E'n Div.: A. B. Starr, *Supt*........Allegheny, Pa.
Geo. J. Parkin, *M. M*..........Allegheny, Pa.
D. M. Peppard, *M. M*.......... Crestline, O.
W'n Div.: C. D. Law, *Supt*.......Ft. Wayne, Ind.
F. D. Casanave, *M. M*........Ft. Wayne, Ind.
A. H. Somers, *Gen. For. Shops*...Chicago, Ill.
(8) Pittsburg, Cincinnati & St. Louis Ry.
4–9 g. 1,172 m. 336 lo. 6,482 cars.
Jas. McCrea, *Gen. Supt*.........Columbus, O.
R. H. Soule, *Supt M. P. & M*. ..Columbus, O.
P. & Col. Div.: E. B Taylor, *Supt*. Dennison, O.
C. B. Street, *M. M*. ....Dennison, O.
A. K. Mansfield, *M. C. B*......Steubenville, O.
Robt. Curtis, *M. M*...............Columbus, O.
Thos. Chamberlain, *M. C. B*... Columbus, O.
C. & M. V. Div.: W. F. Black, *Supt.* Zanesville, O.
Leroy Kells, *M. M*..............Lancaster, O.
Daniel Jewell, *M. C. B*.........Lancaster, O.
Li. Mi. Div.: Ralph Peters, *Supt*....Cincinnati, O.
Leroy Kells, *M. M*...............Cincinnati, O.
Jos. Underwood, *Gen. Foreman.* Cincinnati, O.
Ind. Divs.: J. F. Miller, *Supt*.....Richmond, Ind.
W. W. Reynolds, *M. M*.....Logansport, Ind.
Chas. H. Starr, *M. C. B*......Logansport, Ind.
W. Arp, *Gen. For*..........Indianapolis, Ind.
Chi. Div.: Chas. Watts, *Supt*..Logansport, Ind.
(9) Terre Haute & Indianapolis R. R.
4–9 g. 374 m. 83 lo. 2,868 cars.
Joseph Hill, *Gen. Supt*.........St. Louis, Mo.
C. R. Peddle, *P. Agt*............St. Louis, Mo.
Geo. H. Prescott, *S. M. P. & M.* Terre Haute, Ind.
E. D. Carter, *M. C. B*......Terre Haute, Ind.
Clinton Idler, *M. M*........Indianapolis, Ind.
Chas. Butler, *M. M*...........Effingham, Ill.
A. W. Quakenbush, *M. M*...Logansport, Ind.
Pennsylvania R. R. Co.'s Roads. (7 Gen. Divs.)
4–9 g. 2,704 m. 1,271 loco. 51,894 cars.
Chas. E. Pugh, *Gen Man*......Philadelphia, Pa.
Enoch Lewis, *Pur. Agt*.......Philadelphia, Pa.
John Reilly, *Supt. Trans*......Philadelphia, Pa.
T. N. Ely, *Gen. S. M. P.* (4 Gen. Divs.) Altoona, Pa.
(1) Pennsylvania R. R. Divs.
4–9 g. 1,105 m. 627 lo. 35,583 cars.
S. M. Prevost, *Gen Supt*.........Altoona, Pa
Frank L. Sheppard, *Supt. M. P*..Altoona, Pa.
G. W. Strattan, *M. M*.............Altoona, Pa.
Jno. P. Levan, *Gen. Fore*........Altoona, Pa.
Phila. Div.: Wm. J. Latta, *Supt.* Philadelphia, Pa.
H. D. Garrett, *M. M*....W. Philadelphia, Pa.
I. W. Van Houten, *Gen. For*......W. Phila., Pa
Mid. Div.: H. H. Carter, *Supt*....Harrisburg, Pa.
E. L. Caum, *M. M*.............Harrisburg, Pa.
Samuel W. Myers, *Gen. For.* Harrisburg, Pa.
Alt'a Div.: Jas. Reed, *Supt*..........Altoona, Pa.
Pitts. Div.: Robert Pitcairn, *Supt*....Pittsburg, Pa.
D. O. Shaver, *M. M*................Pittsburg, Pa.
J. G. Stewart, *Gen. For*..........Pittsburg, Pa.
W. Pa. Div.: A. P. Kirtland, *Supt.* Blairsville, Pa.
Wm. B. Norris, *M. M*..........Blairsville, Pa.
M. H. Fails, *Gen. For*..........Blairsville, Pa
Fred. Div.: J. B. Hutchinson, *Supt*.....York, Pa
Tyrone Div.: S. S. Blair, *Supt*.........Tyrone, Pa.
Lew. Div.: Wm. M. Phillips, *Supt.* Lewistown, Pa.
Bed. Div.: Thos. A. Roberts, *Supt*...Bedford, Pa.
Monong. Div.: David M. Watt, *Supt.* Pittsburg, Pa.
Wm. Lininger, *M. M*................Pittsburg, Pa
2) United R. Rs. of N. J. Divs. 414 m. 257 lo. 4,668 c.
F. Wolcott Jackson, *Gen. St*. Jersey City, N. J.
N.Y. Div.: Robt. E. Pettit, *Supt.* Jersey City, N. J
H. S. Hayward, *St. M. P*...Jersey City, N. J.
David H. Baker, *Gen. For.* Jersey City, N. J.
L. A. Bosdevex, *M. M*.........Jersey City, N. J.
E. F. Bosdevex, *Gen. For*..Jersey City, N. J.
Belv. Div.: J. A. Anderson, *Supt.* Lambertv., N. J.
R. McDowell, *M. M*.......Lambertville, N. J.
Amboy Div.: I. S. Buckalew, *Supt.* Camden, N. J.
Thos. Kerr, *M. M*..............So. Amboy, N. J.
P. S. Bogart, *Gen. For*......So. Amboy, N. J.
(3) West Jersey R. R. 4–9 g, 163 m. 22 lo. 342 cars.
Joseph Crawford, *Supt*.........Camden, N. J
W McAllister, *M. M*..............Camden, N. J.
C. C. Williams, *Gen. For*........Camden, N. J.
(4) Phila., Wilm. & Balt. R.R. 212 m. 86 lo. 1,488 c.
H. F. Kenney, *Gen. Supt*. ....Philadelphia, Pa.
S. A. Hodgman, *M. M*.........Wilmington, Del.
W. H. Lungren, *Gen. For*....Wilmington, Del.
Cen. Div.: L. K. Lodge, *Supt*.. Philadelphia, Pa.
S D. Danfield, *M. M. & C. B*....Chester, Pa.
Del. Div.: I. N. Mills, *Supt*......Wilmington, Del.
J. A. Baynard, *M. M*..............Oxford, Md.
C. E. Mason, *M. C. B*............. Oxford, Md.
5) Phila. & Erie R. R. Divs.: 376 m. 117 lo. 3,481 c.
R. Neilson, *Gen Supt*.........Williamsport, Pa.
A. O. Dayton, *Supt. Mo. Po*..Williamsport, Pa.
E'n. Div.: Thos. Gucker, *Supt.* Williamsport, Pa
Sun. H. & W. Div: A. Walters, *Supt.*; and
W. F. Beardsley, *M. M*.........Sunbury, Pa.
Mid. Div.: E. B. Westfall, *Supt*.......Renova, Pa.
Wm. L. Holman, *M. M*..........Renova, Pa.
West'n Div.: J. W. Reynolds, *Supt*.....Erie, Pa.
W. T. Smith, *M. M*.....................Erie, Pa.
(6) Northern Central Ry. 4–9 g. 326 m. 152 lo. 6,163 c
Robert Neilson, *Gen. Supt*...Williamsport, Pa.
A. O. Dayton, *Supt. M. P*....Williamsport, Pa.
A. W. Sumner, *Pur. Agt*........Baltimore, Md.
Susq. Div.: A. Walters, *Supt*....Williamsport, Pa.
Sham. Div.: *Supt*............................Sunbury, Pa.
Elm. & Can. Divs.: S. Meade, *Supt*..Elmira, N.Y.
Jas. Strode, *M. M*...................Elmira, N. Y.
J. C. Dyott, *Gen. For*..............Elmira, N. Y.
Baltimore Div.: H.W. Knapp, *Supt.* Baltimore, Md
(7) Balt. & Pot. & Alex. & Fred. 128 m. 29 lo. 356 c
G. C. Wilkins, *Gen. Supt*........Baltimore, Md
A. W. Sumner, *Pur. Agt*.........Baltimore, Md
J. M. Wallis, *Supt. Mo. Po*.......Baltimore, Md
J. M. Coale, *M. M*...................Baltimore, Md
G. W. Demarest, *Gen. For*......Baltimore, Md
Penn. Coal Co.'s R. R. 4–3 g. 67 m. 23 eng. 2,871 c
J. B. Smith, *Gen. Supt*. ....Dunmore, Pa
And. Crane, *M. M*.................Dunmore, Pa.
Geo. W. Simpson, *M. C. B*........Dunmore, Pa.
Pennsylvania & Erie R. R.—Early Branch.
C. R. Early, *Gen. Supt*...........Ridgeway, Pa.
Pensacola & Perdido R. R. 6 g. 8 m. 5 lo. 73 cars.
B. F. Simmons, *Pr. & Supt*.... Pensacola, Fla.
H. W. Simmons, *Pur. Agt*......Pensacola, Fla.
R. G. Nicholl, *M. M. & C. B*.....Pensacola, Fla.
Peoria, Decatur & Evansville Ry.
4–8½ g. 254 m. 30 lo. 1,458 cars.
G. L. Bradbury, *Gen. Man*........ Peoria, Ill.
P. Reilly, *M. M*.....................Mattoon, Ill.
Peoria & Farmington R. R. 4–8½ g. 25 m. 2 lo. 25 c.
D. P. Phelps, *Gen. Man*.........Monmouth, Ill.
John F. Wallace, *Supt*.........Farmington, Ill.
Peoria & Pekin Union Ry. 4–8½ g. 20 m. 12 lo. 100 c.
Thos. B. Burnett, *Gen. Supt. & P. A.* Peoria, Ill.
R. F. Hurd, *M. M. & C. B*.........Peoria, Ill.
Perkiomen R. R. 4–8½ gauge 39 miles.
D. B. Clack, *Supt*......Perkiomen Junction, Pa.
Petersburg R. R. 4–8½ g. 64 m. 10 lo. 131 cars
R. M. Sully, *Gen. Supt*.........Petersburg, Va.
L. E. Clark, *Pur. Agt*..........Petersburg, Va.
R. B. Andrews, *M. M*..........Petersburg, Va.
J. W. Fleming, *M. C. B*.........Petersburg, Va.
Phila., Wilmington & Balt. R. R. (*See Penna. R. R.*)
Phila. & Atlantic City Ry. 3–6 g. 54 m. 11 lo. 134 cars
F. S. Urie, *Supt. & Pur. Agt*..Philadelphia, Pa.
John T. Keihner, *M. M*...........Camden, N. J
E. Lippincott, *M. C. B*..........Camden, N. J.
Phila. & Reading. 4–8½ g 486 m. 539 lo. 24,606 cars.
John E. Wootten, *Gen. Man*..Philadelphia, Pa.
W. S. Wilson, *Pur. Agt*. ....Philadelphia, Pa.
Geo. Eltz, *Supt Trans*...............Reading, Pa.
L. B. Paxson, *Eng. of Mach*.......Reading, Pa.
No. Pa. & B. Brk. Div.:
I. A. Sweigard, *Supt*........Philadelphia, Pa.
Mah. & Sham. Br.:
J. H. Olhausen, *Supt*......Mahoney Plane, Pa
Cat. & Willp't. Br.:
D. C. Reinhart, *Supt*. ......Williamsport, Pa.
M. Hill & S. Haven Br.:
A. A. Hesser, *Supt*.............Cressona, Pa.
Sch. & Sus. Br.:
H. H. Tracy, *Supt*..............Pine Grove, Pa.
Read. & Col. Br.:
A. M. Wilson, *Supt*...............Columbia, Pa.
Pittsburg, Bradford & Buffalo Ry. 3 g. 31 m. 4 lo. 79c
J. M. Dickey, *Gen. Man*...........Foxburg, Pa.
W. D. Reed, *Supt*......................Foxburg, Pa.
Pittsburg, Cincinnati & St. Louis Ry. (*See Penna. Co.*)
Pittsburg, Ft. Wayne & Chicago Ry. (*See Penna. Co.*)
Pittsburg Southern Ry. 3 g. 38 m. 4 lo. 64 cars.
M. D. Hays, *Supt. & P. A*.........Pittsburg, Pa.
W. S. Marshall, *M. M*.............Pittsburg, Pa.
E. B. Gosline, *M. C. B*...........Pittsburg, Pa.
Pitts. & Castle Shannon R. R. 3–4 g. 9 m. 5 lo. 388 c.
James M. Bailey, *Gen. Supt*.. Pittsburg, Pa.
Holmes Ward, *M. M*......Castle Shannon, Pa.
Wm. E. Long, *M. C. B*............Pittsburg, Pa.
Pitts. & Lake Erie R. R. 4–8¾ g. 70 m. 31 lo. 1,688 c.
W. C. Quincy, *Gen. Man*.........Pittsburg, Pa.
R. W. Jones, *Mast. Trans*.......Pittsburg, Pa.
S. W. Haines, *M. M*..............Pittsburg, Pa.
Pittsburg & Western R. R. 3 g. 47 m. 2 lo. 76 cars.
E. K. Hyndman, *Gen. Man*.......Pittsburg, Pa.
C. P. Ford, *Pur. Agt*.............Allegheny, Pa.
W. L. Hofecker, *M. M*...........Zelienople, Pa.
Port Huron & No.-Western Ry. 3 g. 105 m. 4 lo. 66 c.
H. McMorran, *G. Man. & P. A.* Port Huron, Mich.
I. R. Wadsworth, *Supt*.......Port Huron, Mich.
Chas. Deifenbach, *M. M*.....Port Huron, Mich.
Benj. Hillier, *M. C. B*........Port Huron, Mich.
Port Royal & Augusta Ry. 5 g. 112 m. 13 lo. 235 c.
J. N. Bass, *Supt*....................Augusta, Ga.
John McCann, *M. M*...............Augusta, Ga.
J. H. Milton, *M. C. B*..............Augusta, Ga.
Portland & Ogdensburg. 4–8½ g. 114 m. 11 lo. 289 c.
J. Hamilton, *Gen. Supt. & P. A*..Portland, Me.
Geo. H. Poor, *M. M*..............Portland, Me.
W. G. Brewer, *M. C. B*...........Portland, Me.
Portland & Rochester R. R. 4–8½ g. 52 m. 7 lo. 230 c.
J. W. Peters, *Supt. & Pur Agt*...Portland, Me.
E. H. C. Tompson, *For. of Mach*..Portland, Me.
David Dow, *For. of Car Repairs*. Portland, Me
Potomac, Fred.'g & Pied. R. R 3 g. 38 m 2 lo. 38 c.
Will M. Grafton, *Supt*.......Fredericksburg, Va.
Pough., Hart. & Bos. R. R. 4–8½ g. 45 m. 4 lo. 64 c.
J. A. Perkins, *Supt*........Poughkeepsie. N. Y.
John L. Donaldson, *M. M.* Poughkeepsie, N. Y.
Prince Edward Island Ry. 3–6 g. 199 m. 17 lo. 280 c
L. B. Archibald, *Supt. & Pur. Agt.*;
Jos. Unsworth, *M. Supt. & Storekeeper*; and
D. M. Fraser, *M. C. B*.. .Charlottetown, P. E. I.
Prov., Warren & Bristol R. R. 4–8½ g. 19 m. 5 lo. 38 c.
Waterman Stone, *Supt*..........Providence, R. I.
Rufus Smith, *M. M. & C. B*.........Bristol, R. I.
Prov. & Springfield R. R. 4–8½ g. 23 m. 3 lo. 83 c.
Wm. Tinkham, *Gen. Man*.....Providence, R. I
G. T. Richardson, *M. M*........Providence, R. I.
Prov. & Worcester. 4–8½ g. 66 m. 30 lo. 858 c.
W. E. Chamberlain, *Supt*.....Providence, R. I.
A. Griggs, *Supt. L. & C. D*....Providence, R. I.
Pullman's Palace Car Co. 472 passenger cars.
A. B. Pullman, *2d V.-Pr. & G. M*.. Chicago, Ill.
Geo. F. Brown, *Gen. Supt*.........Chicago, Ill.
Wm. A. Angell, *Pur. Agt*...........Chicago, Ill.
S. W. Bretzfield, *Asst. Pur. Agt.* New York, N.Y.
A. Rapp, *Man.* (Chicago Works)...Chicago, Ill.
H L. Spaulding, *Man.* (Det Shops). Detroit, Mich.
E. A. Benson, *Supt. Shops*.........St. Louis, Mo.

Q

Quebec Central Ry. 4–8½ g. 139 m. 3 lo 79 cars.
A. Steele, *Supt*................ Sherbrooke, Que.
R. D. Morkill, *Pur. Agt*.......Sherbrooke, P. Q.
Jas. Seiveright, *M. M*......Sherbrooke, P. Q.
Quebec & Lake St. John Ry. 4–8½ g. 24 m. 3 lo. 43 c
J. G. Scott, *Manager*..............Quebec, Can
Frank Fournier, *Supt*......St. Raymond, P. Q
John T. Eames, *M. M*......St. Raymond, P. Q.

R

Raleigh & Augusta Air-Line; Carolina Central.
Raleigh & Gaston R. Rs. 4–8½ g. 436 m. 47 lo. 994 c.
John C. Winder, *Gen. Man. & P. A.* Raleigh, N. C
Raleigh Rds. 4–8½ g. 194 m. 21 lo. 563 cars.
B. R. Harding, *Supt. of Mach.* Raleigh, N. C.
Carolina Cen. R.R. 4–8½ g. 242 m. 26 lo. 431 c.
L. C. Jones, *Gen. Supt*.....Wilmington, N. C.
James Maglenn, *M. of Mach.* Laurinburg, N. C.
S. R. Ethridge, *M. C. B*....Laurinburg, N. C.
Rensselaer & Saratoga R.R. (*See Del. & Hud. Can. Co.*)
Rhinebeck & Connecticut. (*See Hart. & Ct. Wn.*)
Richmond, Fredericksburg & Potomac R. R.
4–8½ g. 83 m. 14 lo. 137 cars.
E. T. D. Myers, *Gen. Supt*..... Richmond, Va.
T. L. Courtney, *Asst. Supt*......Richmond, Va.
H. Kuhn, *M. M*.....................Richmond, Va.
W. H. Trainham, *M. C. B*.......Richmond, Va.
Richmond & Alleghany R.R. 4–9 g. 260 m. 19 lo. 837c.
Decatur Axtell, *V. P. & Gen. Man.* Richmond, Va.
Geo. W. Agee, *Supt*............Richmond, Va.
M. Sweeney, *Pur. Agt*...........Richmond, Va.
Geo. D. Harris, *M. M. & C. B*...Richmond, Va.
Richmond & Danville R. R. Co.'s Roads.
1,718 miles 218 loco. 3,616 cars.
T. M. R. Talcott, *Gen. Man*......Richmond, Va.
J. P. Minetree, *Pur. Agt*........ Richmond, Va.
R. D. Wade, *Supt. Mo. Po*.......Richmond, Va.
(1) Rich. & Dan. R. R. 5 g. 829 m. 131 lo. 2,480 cars.
Peyton Randolph, *As. G. Man*..Richmond, Va.
Rich. & Dan. Div.: 5 g. 320 m. 80 lo. 1,797 c.
Wm. H. Green, *Supt*..........Richmond, Va.
T. W. Gentry, *M. M*...........Richmond, Va.
J. B. Vaughan, *For. Car Sh*...Richmond, Va.
North Carolina Div. 5 g. 223 m. 22 lo. 268 cars.
A. B. Andrews, *Supt*............Raleigh, N. C.
W. H. Turrentine, *M. M.* Comp'y's Shops, N. C.
J C. Holt, *For. Car Sh.* Comp'y's Shop N. C.
Atlanta & Char. Air Line. 5 g. 286 m. 31 lo. 415 c.
Narrow-Gauge Branches. 3 g. 80 m. 5 lo. 37 c.
I. Y. Sage, *Supt*.......................Atlanta, Ga.
W. A. Walden, *M. M*...............Atlanta, Ga.
Z. T. Smith, *For. Car Sh*.........Atlanta, Ga.
(2) Charlotte, Col. & Aug. R. R. 5 g. 239 m. 22 lo. 287 c
G. R. Talcott, *Supt*..............Columbia, S. C.
J. H. Green, *M. M.* (2 roads)...Columbia, S. C
J. H. Perkins, *For. Car Sh*....Columbia, S. C
(3) Columbia & Greenville R. R. 5 g. 297 m. 22 l. 218 c
J. W. Fry, *Supt*..................Columbia, S. C
J. O Meredith, *For. E. & C. Rep*.. do.

NOYES'
Patent Liquid and Condensed COOLER.

For Cooling Railroad Car and Steamboat Journals and Bearings of all Kinds, and for Mixing with Other Oils.

The attention of those who are running heavy journals is respectfully invited to the above Liquid Cooler. It has been successfully used for upward of ten years, and is constantly growing in favor, as its merits become known, and we are confident that practical men cannot fail of being convinced that our preparation deserves their candid attention. What we claim for it is:

That it will Cool a Hot Journal When in Motion,

and extinguish the flame when the box is on fire; that its use will, in a great measure, prevent the occurrence of a hot journal, and save the expense, delays and annoyances incident thereto; that it will eliminate the heat from a journal at a temperature greatly below the point required to melt the babbitt, preventing the accumulation of heat, and by a timely application save it from destruction; that its non-inflammable elements (where waste is used) permeate the waste and prevent its taking fire; that it keeps the journal smooth and polished, preventing unnecessary friction; that its combination is based upon true scientific principles, which renders it impossible to fail in its results, and is the

Only Preparation that will Cool a Hot Journal

while it is in motion, as attested by certificates below; that one thorough application on a hot journal will do more execution in cooling than the constant application of water for half an hour, besides doing it evenly and without loss of time.

Every Railroad Train or Steamboat

should have a can of the Liquid Packing on board, with the directions for its use pasted upon it, and thus have always at hand the means of effectually cooling a hot journal, and thereby avoid the expense, danger and trouble from this cause.

WHAT RAILROAD MEN SAY OF IT.

Salem, Aug. 7, 1872.

Mr. P. Noyes.—*Dear Sir:* I have been using your Liquid Packing for cooling car journals for some time past, and have been well pleased with it. I have had occasion to use it a number of times, under Pullman cars, and it has been a complete remedy in every case of hot journals.

Every train should be provided with it, as it is a saving of time and expense in the running of trains, provided it is applied and cared for according to directions for using. Yours truly,

J. P. Somerby,
M. C. B. Eastern Railroad.

Salem, Aug. 28, 1880.

I can recommend Noyes' Liquid Cooler as an excellent article to carry on trains for use in case of Hot Journals, which it cools, without injury to the journals, more effectually than anything I know of.

J. B. Billings,
M. C. B. Eastern Railroad.

Boston, April 7, 1880.

P. Noyes, Agent.—*Dear Sir:* Please send for account of Eastern Railroad five barrels Liquid Cooler.

Geo. J. Fisher, P. A.

Boston, May 24, 1877.

P. Noyes, Agent.—*Dear Sir:* Having used your Liquid Cooler two or three years, I find it necessary for the safe running of our cars to continue its use. When the cooler is mixed with black oil, according to directions, the compound is equal to lard or sperm oil, and it is the best Cooler I have ever used.

Yours truly, John F. Crockett,
Master Mechanic Boston, Lowell & Nashua R. R.

Boston, April 23, 1880

Belt and Leather Stuffing Co.—*Gents:* Please send to East Cambridge, for account Boston & Lowell Railroad, five barrels Liquid Cooler.

Yours truly, F. H. Nourse,
Purchasing Agent.

Our Liquid Cooler is now in use, and has been from one to eight years, upon the following roads, and we have numerous recommendations from them: Boston & Maine R. R., Boston & Lowell R. R., Intercolonial R. R., Boston, Concord & Montreal R. R., Fitchburg R. R., Eastern R. R., New York, New Haven & Hartford R. R., New York & New England R. R., Connecticut River R. R., Delaware & Hudson Canal Co., Old Colony.

In ordering state whether it is desired for general Lubricating or Cooling. The Condensed is sold, especially for Lubricating, by the Pound, and the Liquid by the Gallon, as low as any article of the quality in the market.

SEND FOR A BARREL. NO CHARGE UNLESS IT DOES ALL WE STATE.

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NOYES MANUFACTURING CO., P. Noyes, General Manager.

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We are sole agents for the Swift "Muffler" for Locomotives, Improved Car Axle-Box Dust Guard, and are Agents for the Ormsby Patent Car-Sash Holder and Lock.

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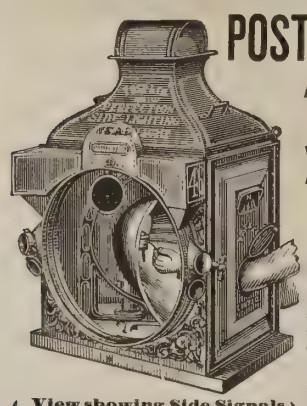
SIDE-LIGHTING

HEAD-LIGHT,

Largest AND **BEST** Head-Light MADE.



(View showing Side Signals, Numbers and Nicholson's Pat. Colored Signals, with Reflector turned in position for lighting. No more lanterns required on Engines.

The New Reservoir is constructed on our **American Student Lamp principle**, which keeps the oil at a **constant level** until **all is consumed**, thereby saving 2 inches of each **wick**, and it overcomes the **unsteadiness** of the flame, caused by **splashing** of the large body of oil in the reservoirs of ordinary **Head-Lights**. This reservoir can be **readily taken out to be refilled.** Send for Circular of

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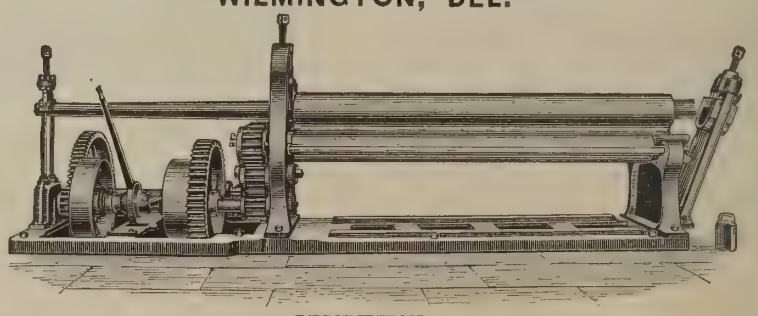
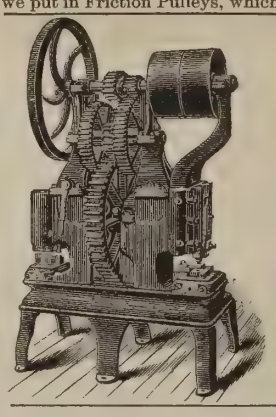


DESCRIPTION.

The annexed cut represents all sizes we make to be driven by belt. It will be seen at once that it is but the work of a moment to balance the top roll and lower the hinge housing, to take out the plate when a full circle is bent. The rolls are all made of Solid Wrought Iron, the Balance Bar being a part or extension of the top roll. There is a Cast-Iron Bed-Plate under the entire machine. To save any shifting of belts we put in Friction Pulleys, which enable the rolls to be started, stopped or reversed instantly.



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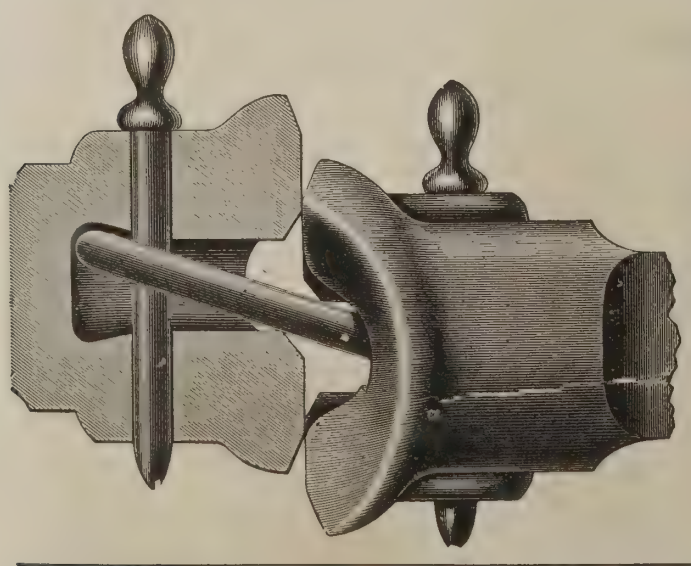

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Victory over more than 30 Self-Couplers in the Master Car-Builder's Convention of June, 1876. Also indorsement for safety in coupling by the Yard Masters, in their Convention, June, 1877, and by 300 others who were unable to attend the Convention, and 300 railroad officials who are resident in 26 States, and who admitted superiority over any other yet produced. Try 30 free of royalty, and see for yourself! Pattern free, and no change in timbers or connections. Those made by Wilson, Walker & Co., Pittsburgh, Pa, *will save 200 per cent. in repairs,* and give double life service over *old styles of* wrought iron. About 43,000 in use by 146 railroads. The *saving in repairs* by using *my invention* is from 20 per cent. to 80 per cent. as per *report of many officers.*

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(4) Virginia Midland Ry. 4–8½ g. 353 m. 41 lo. 631 c.
W. M. S. Dunn, *Eng. & Supt.* Alexandria, Va.
J. E. Waddey, *M. of M.* ...... Alexandria, Va.
J. T Nalls, *M. C. B* .... Alexandria, Va
Richmond & Petersburg R.R. 4–8½ g. 25 m. 8 lo. 130 c
J. R. Kenly, *Supt* .... Richmond, Va.
John O'Brien, *M. M.* .... Richmond, Va.
Rio Grande R. R. 3–6 g. 22 m. 3 lo. 39 cars.
M. J. Gomila, *Rec. & Gen. Man.* Brownsville, Tex.
G. W. Rendall, *M. M.* .... Brownsville, Tex.
M. Markwood, *M. C. B.* ... . Brownsville, Tex.
Rochester & Pittsb'g. R.R. 4–8½ g. 134 m. 11 lo. 612 c
Geo. E. Merchant, *Gen. Man.* ... Rochester N. Y.
J. P. Hovey, *M. M.* .... Rochester, N. Y.
Rock Island & Mercer County R. R., and
Rock I'd & Peoria Ry. 4–8½ g. 113 m. 12 lo. 357 c.
R. R. Cable, *V.-P. & Gen. Supt.*. Rock Island, Ill.
R. I. & P. Ry.: H. B. Sudlow, *Supt. & P. A.* do.
Joseph Elder, *M. M.* .... Peoria, Ill.
R I & M. C. Rd.: B. T. Cable, *Supt.* R'k Island, Ill.
J. H. Parks, *M. M.* .... Rock Island, Ill.
Rome (Ga.) R. R. 5 g. 20 m. 2 lo. 13 cars.
Eben Hillyer. *Supt* .... Rome, Ga.
O. W. Harbin, *M. M. & C. B* .... Rome, Ga.
Rome, Watertown & Ogdensburg R. R.
4–8½ g. 409 m. 51 lo. 1,400 cars.
E. A. Van Horne, *Gen. Supt* ...... Oswego, N. Y.
Geo. W. B. Cushing, *Pur. Agt.* New York, N. Y.
Geo. H. Haselton, *M. M. & C. B.*. Oswego, N. Y.
Rumford Falls & Buckfield R.R. 4–8½ g. 29 m. 2 l. 42 c.
O. Hayford, *Supt* .... Canton, Me.
O. Spaulding, *Pur. Agt* .... Buckfield, Me.
E. R. Oldham, *M. M* .... Buckfield, Me.

S

Sabine & East Texas Ry. 4–8½ g. 104 m. 5 lo. 333 c.
R. H. Cousins, *Gen. Supt.* ..... Beaumont, Tex.
W. A. Meagher, *M. M.* .... Beaumont, Tex.
Sacramento & Placerville R. R. 4–8½ g. 49 m. 3 lo. 68 c.
J. B. Wright, *Supt. & P. A.* ... Sacramento, Cal.
A. J. Stevens *M. M.* .... Sacramento, Cal.
Benj. Welch, *M. C. B* .... Sacramento, Cal.
Saginaw Bay & Northw'n R. R. 4–8½ g. 30 miles.
J. Jackson, *Gen. Man.* ... ... Pinconning, Mich.
F. T. Lillote, *Act. Pur. Agt.* .. Pinconning, Mich
Edward Keeler, *M. M.* .... Pinconning, Mich.
Saginaw Valley & St. Louis R. R. 4–8½ g. 35 m. 4 l. 64 c
N. W. Merrill, *Supt* .... Saginaw, Mich.
Allan Bourn, *Pur. Agt.* ... . Detroit, Mich.
Geo. C. Watrous, *M. M.* .... Iona, Mich.
San Francisco & No. Pac. 4–8½ g. 112 m. 11 lo. 244 c.
Arthur Hughes, *Gen. Man.*. San Francisco, Cal.
H. C. Whiting, *Supt.* ... . Petaluma, Cal.
Ed. Reynolds, *Gen. M. M.* .... Donahue, Cal.
Savannah, Florida & W'n Ry. 5 g. 422 m. 50 lo. 695 c.
H. S. Haines, *Gen. Man* .... Savannah, Ga.
R. G. Fleming, *Supt* .... Savannah, Ga.
F. S. Pendergast, *Eng. & Asst. Supt.* Savannah, Ga.
A. A. Aveilhé, *Pur. Agt* .... Savannah, Ga.
James D. Hollister, *M. of Mach.*. Savannah, Ga.
G. M. D. Riley, *For. Loco. Dept* ... Savannah, Ga.
Jos. W. Rowell, *For. Car Dept.* Savannah, Ga.
Sav., Griffin & No. Ala. R. R. *Op. by Central (Ga.).*
Schuylkill & Lehigh R. R. 4–8½ g. 43 miles.
Eldredge Dale, *Supt.* ... . Reading, Pa.
Scoharie Valley R. R. (*See Middleburg & Sch.*)
Scioto Valley R. R. 4–8½ g. 131 m. 15 lo. 460 cars.
Geo. Skinner, *Supt.* . ... Columbus, O
R. Bromley, *M. M. & P. A.* ..... Portsmouth, O.
Seaboard & Roanoke R. R. 4–8½ g. 80 m. 21 lo. 381 c.
E. G. Ghio, *Mast. of Trans.* .. Portsmouth, Va.
M. M. Pendleton, *S. M. P. & M.* Portsmouth, Va.
Shenandoah Valley R. R. 4–8½ g. 143 m. 15 lo. 104 c.
Henry Fink, *Gen. Man* .... Lynchburg, Va.
J. H. Sands, *Supt* .... Roanoke, Va.
W. C. De Armond. *Pur. Agt.*. Philadelphia, Pa.
Chas. Blackwell, *Supt. of M. P.*. Roanoke, Va..
W. Welch, *M. M.* .... Roanoke, Va.
Shenango & Allegheny R.R 4–9½ g. 47 m. 6 lo. 156 c.
J. T. Blair, *G. Supt. & Pur. Agt.* Greenville, Pa.
Edw. Richardson, *M. M. & C. B.* Greenville, Pa.
Shepaug R. R. 4–8½ g. 38 m. 3 lo. 27 cars.
Edwin McNeill, *Supt* .... Litchfield, Ct.
C. M. Allen, *M. M.* .... Litchfield, Ct.
Ship Is., Ripley & Ky. R. R. 3 g. 25 m. 2 lo. 23 cars.
C. L. Harris, *Supt. & Pur. Agt* .... Ripley, Miss.
W. H. Phelps, *M. M.* .... Ripley, Miss.
Sioux City & Pacific R. R. 4–8½ g. 427 m. 21 lo. 594 c.
P. E. Hall, *Gen. Man. & P. A.* Cedar Rapids, Ia.
C. M. Lawler, *Gen. Supt* .... Missouri Valley, Ia.
J. S. Wattles, *Supt.* ... ... Missouri Valley, Ia.
C. F. McCoy, *Asst. Supt* .... Blair, Neb.
S. A. Teal, *M. M.* .... Missouri Valley, Ia.
W. H. Ramseyer, *M. C. B.* .. Missouri Valley, Ia.
Sodus Bay & Southern Ry. 4–8½ g. 34 m. 4 lo. 40 c.
S. B. Stuart, *Supt. & Pur. Agt.* Sodus Point, N.Y.
C. H. Hill, *M. C. B* .... Sodus Point, N. Y.
South Carolina Ry. 5 g. 243 m. 42 lo. 685 cars.
John B. Peck, *Gen. Man.* ...... Charleston, S. C.
S. B. Pickens, *Pur. Agt* .... Charleston, S. C.
P. J. Cochrane, *Mast. of Mach.* Charleston, S. C.
Geo. H. Gramling, *M. C. B.* ... Charleston, S. C.
South-Eastern Ry. 4–8½ g. 260 m. 26 lo. 826 cars.
Bradley Barlow, *Gen. Man.* .... Montreal, Can.
T. A. McKinnon, *Asst. Man.* .... Montreal, Can.
H. A. Alden, *Supt.* .... W. Farnham, P. Q.
A. G. Eastman, *M. M.* .... .. W. Farnham, P. Q.
South Florida R. R. 3 gauge 40 m. 4 lo. 20 cars.
B. R. Swoope, *Supt. & P. A.* .. .... Sanford, Fla.
C. C. Haskell, *Pur. Agt* .... Sanford, Fla.
J. A. Campbell, *M. M.* .... Sanford, Fla.
A. D. Stentiford, *M. C. B* .... Sanford, Fla.
South Mountain R. R. 4–8½ g. 18 m. 4 lo. 22 c.
W. H. Woodward, *Supt.* Pine G've Furnace, Pa.
South Pacific Coast R. R. 3 g. 81 m. 10 lo. 260 cars.
A. H. Fracker, *Gen. Supt*. San Francisco, Cal.
G. H. Waggoner *Pur. Agt.*. San Francisco, Cal.
E. L. Reese, *M. M. & C B.* .... Newark, Cal.
South-Western R. R. (Ga.) (*See Central of Ga.*)
South-Western Ry. (Ky.) 4–8½ g. 4 m. 1 lo. 38 cars.
J. M. Wilson, *Supt* .... Harrodsburg, Ky.
J. Tomlinson, *Pur. Agt* ...... Harrodsburg, Ky.
Southern Central R. R. 4–8½ g. 115 m. 16 lo. 447 c.
James G. Knapp, *Supt. & Pur. Agt.* Auburn, N.Y.
Chas. G. Brown, *M. M.* ... ... Auburn, N. Y.
H. Mooney, *M. C. B* .... Auburn, N. Y.
Southern Maryland R. R. 4–8½ g. 20 m. 1 lo. 5 c.
Robert Knight, *Supt.* .... Brandywine, Md.
C. R. Joyce, *M. M.* .... Brandywine, Md.
Southern Pacific R. R. 4–8½ g. 198 m. 30 lo. 728 c.
Northern Div. (*For other Divs. see Cen. Pac.*)
A. C. Bassett, *Supt* .... San Francisco, Cal.
J. R. Watson, *Pur. Agt* ..... Sacramento, Cal.
J. T. Wilson, *M. M.* .... San Francisco, Cal.
F. N. Bellisle, *M. C. B.* ... San Francisco, Cal.
Springfield, Effingham & So.-E. and Bloomfield Rys.
3 g. 89 m.
W. C. Lyon, *Gen. Man. & Pur. Agt.* Robinson, Ill.
J. S. Pickering, *M. M. & C. B.* ... Effingham, Ill.
Spring Hill & Parrsboro Ry. 4–8½ g. 32 m. 1 lo. 64 c.
J. A. Killam, *Gen. Man* .... Parrsboro, N. S.
K. McKinnon, *M. M.* .... Parrsboro, N. S.
St. Croix & Penobscot R. R. 4–8½ g. 22 m. 4 lo. 195 c.
S. W. Haycock, *Supt. & Pur. Agt.* . Calais, Me.
G. H. Corsen, *M. M.* .... Milltown, Me.
H. C. Tincker, *M. C. B* .... Milltown, Me.
St. John & Maine Ry. 4–8½ g. 92 m. 9 lo. 146 cars.
H. D. McLeod, *Supt. & P. Agt.* .. St. John, N. B.
Andrew Davis, *M. M.* ... . St. John, N. B.
St. John's Ry 4–8½ g. 14½ m. 2 lo. 24 cars.
R. McLaughlin, *Pr. & Supt.* . Jacksonville, Fla.
Geo. Ferro, *M. of Mach.* ... . Tocoi, Fla.
St. Johnsb'ry & Lake Champ 4–8½ g. 120 m 10 lo. 297 c.
A. B. Jewett, *Supt. & P. A.*. St. Johnsbury, Vt.
Geo. E. Howe, *M. M. & C. B.* St. Johnsbury, Vt.
St. Joseph & Des Moines R R. (*See K. C., St. J. & C. B.*)
St. Lawrence & Ottawa Ry, 4–8½ g. 59 m. 10 l. 146 c.
Archer Baker, *Gen. Supt* .... Montreal, Ont.
R. Blackwell, *Mech. Supt* ... ... Montreal, Ont.
St. Louis, Alton & Terre Haute R R.
Main Line. (*See Ind. & St. L. Div.: Ohio Ry.*)
St. Louis & Cairo Div.: 4–8½ g 137 m. 17 lo. 778 c.
G. W. Parker, *Gen. Man* ...... St. Louis, Mo.
J. L. Hinckley, *Supt.* ... ... Belleville, Ill.
A. M. De Clerq, *M. M.* .... St. Louis, Mo.
St. Louis Bridge Co. and Tunnel R. R.
4–8½ g. 27 m. 18 lo. 11 cars.
Wm. Taussig, *Gen. Man* .... St. Louis, Mo.
A. W. Dickinson, *Supt.* ... . St. Louis, Mo.
J. E. Williams, Jr., *Pur. Agt* .... St. Louis, Mo.
H. M. Smith, *M. M.* .... St. Louis, Mo.
St. Louis Coal R. R. 4–8½ g. 28 m. 1 lo. 78 cars.
Jas. Prentice. *Supt* .... Carbondale, Ill.
Jas. C. Bryden, *Pur. Agt* ... . St. Louis, Mo.
St. Louis, Ft. Scott & Wichita R.R. 4–8½ g. 128 miles.
F. Tiernan, *V. P. & Gen. Man.*. Fort Scott, Kan.
J. W. Miller, *Gen. Supt* .... Fort Scott, Kan.
Henry Berger, *M. M* .... Ft. Scott, Kan.
A. A. Tiddell, *M. C. B.* .... Ft. Scott, Kan.
St. L., Hannibal & Keokuk. 4–8½ g. 85 m. 5 lo. 65 c.
W. W. Walker, *Gen. Supt* .... Hannibal, Mo.
Geo. Douglass, *Pur. Agt* .... Hannibal, Mo.
St. Louis, Iron Mt. & So'n Ry. (*See Mo. Pacific Ry.*)
St. L. Keokuk & No.-W'n. 4–8½ g. 187 m. 14 lo. 312 c.
R. Law, *Gen. Supt* .... Keokuk, Ia.
G. B. Harris, *Pur. Agt* .... Chicago, Ill.
Wm. H. Bartlett, *M. M.* ... . Keokuk, Ia.
St. L., Salem & Little Rock. 4–9 g. 69 m. 5 lo. 103 c
H. A. Crawford, *V. Pr. & P. A.* .. St. Louis, Mo.
E. B. Sankey, *Supt* .... Salem, Mo.
Thomas Everson, *M. M.* .... Steelville, Mo.
J. W. Houston, *M. C. B* .... Steelville, Mo.
St. L., Van. & T. H. (*See T. H. & I. Div. of Penna. Co.*)
St. Louis & Cairo R. R. 3 g. 152 m. 22 lo. 896 cars.
Chas. Hamilton, *Gen. Supt.* .... . St. Louis, Mo.
R. M. Pringle, *M. M.* .... St. Louis, Mo.
St. L. & San Fran. Ry. 4–8½ g. 854 m. 80 lo. 2,700 c.
C. W. Rogers, *V. P. & Gen. Man.*. St. Louis, Mo.
D. H. Nichols, *Mast. Tran.*. No. Springfield, Mo.
A. G. Thompson, *Pur. Agt* .... St. Louis, Mo.
M. Kearney, *M. M. & C. B.*. No. Springfield, Mo.
Mo. & Ark. Div.: W. A. Thoms, *Supt.* do.
Kan. Div.: J. R. Wentworth, *Supt.* Neodesha, Kan.
St. Martin's & Upham Ry. 4–8½ g. 30 m. 2 lo. 8 cars.
A. E. Killam, *Manager* .... St. Martin's, N. B.
St. Paul, Minneapolis & Manitoba Ry.
4–8½ g. 1,125 m. 168 lo. 4,331 cars.
A. Manvel, *Gen. Man* .... St. Paul, Minn.
E. B. Wakeman, *Asst. Gen. Supt.* St. Paul, Minn.
J. C. Morrison, *Pur. Agt* .... St. Paul, Minn.
H. Middleton, *M. M. & C. B* ... St. Paul, Minn.
Breck. Div.: A. Guthrie, *Supt.*. . St. Paul, Minn.
F. F. Div.: J. B. Rice, *Supt* .... St. Paul, Minn.
No'n Div.: D. K. Smith, *Supt* .... Crookston, Minn.
St. Paul & Duluth R.R. 4–8½ g. 196 m 24 lo. 580 c.
H. P. Breed, *Asst. Gen. Supt* .... St. Paul, Minn.
J. G. Callahan, *Pur. Agt* .... St. Paul, Minn.
W. McFarland, *M. M.* .... St. Paul, Minn.
John Hill, *M. C. B.* .... St. Paul, Minn.
Sterling Mountain Ry. 6 g. 8 m. 2 lo. 145 cars.
J. C. Missimer, *Supt* .... Sloatsburg, N. Y.
Syracuse, Binghamton & N. Y. R R. (*See D. L. & W.*)
Syracuse, Chenago & N. Y. 4–8½ g. 44 m. 4 lo. 60 c.
Albert Allen, *Supt* .... Syracuse, N. Y.
George W. West, *M. M.* ... . Syracuse, N. Y.
Wm. J. McMichael, *M. C. B.* .. Syracuse, N. Y.
Syracuse, Geneva & Corning; Corning, Cowanasque & Antrim R. Rs. 4–8½ g. 121 m. 28 lo. 1,044 c.
A. H. Gorton, *Supt* .... Corning, N. Y.
W. E. Gorton, *Asst. Supt* .... Corning, N. Y.
Andrew Beers, *Pur. Agt* .... Corning, N. Y.
O. C. Patchell, *M. M.* .... Corning, N. Y.
C. J. Butler, *M. C. B* .... Corning, N. Y.

T

Terre Haute & So.-Eastern Ry. 4–9 g. 40 miles.
Geo. Atherton, *Supt* .... Terre Haute, Ind.
Texas-Mexican; and Mexican National Rys.
3 g. 333 m. 28 lo. 600 cars.
G. C. Gardner, *Gen. Man* .... New York, N. Y.
W. E. Lewis, *Supt* .... Mexico, Mex.
J. Dougherty, *Pur. Agt* ... . New York, N. Y.
No. Div.: F. A. Lister *G. M.*. Corpus Christi, Tex.
P. J. Milan, *M. M. & C. B.* do.
Mex. Nat. Ry.: J. C. Monroe, *M. M.*. Mexico, Mex.
Jno. Scullen, *Gen. Man* .... Mexico, Mex
Texas Western Ry. 3 g. 42 m. 2 lo. 34 cars.
E. L. Heriot, *Gen. Man.* ...... Houston, Tex.
J. W. Goodwin, *Supt* .... Houston, Tex.
T. F. Glispin, *M. M.* .... Houston, Tex.
Texas & New Orleans; Louisiana W'n R. Rs.
4–8½ g. 217 m. 25 lo. 900 c.
A. N. Towne, *Gen. Man* .... Houston, Tex.
P. B. Watson, *Pur. Agt* ... . Houston, Tex.
C. A. Burton, *Supt* .... Houston, Tex.
D. C. Smith, *M. M.* .... Houston, Tex.
J. M. Mather, *M. C. B* .... Houston, Tex.
Texas & Pacific. (*See Mo. Pac. Ry.*)
Texas & St. Louis Ry. 3 g. 304 m. 19 lo. 338 cars.
G. W. Ristine, *Gen. Man* . ..... St. Louis, Mo.
J. B. Van Dyne, *Gen. Supt.* .... Tyler, Tex.
F. W. Paramore, *Pur. Agt* . ... St. Louis, Mo.
L. B. Fish, *Pur. Agt* .... Tyler, Texas.
G. W. Prescott, *S. M. P. & M* ... St. Louis, Mo.
Tioga and Elmira State Line R. Rs.
4–8½ and 6 g. 54 m. 17 lo. 953 cars.
L. H. Shattuck, *Supt* .... Blossburg, Pa.
J. A. Hardenburg. *Pur. Agt.*. New York, N. Y.
Pere Bonny, *M. M.* .... Blossburg, Pa.
D. H. Stratton, *M. C. B* .... Blossburg, Pa.
Toledo, Ann Ar. & Gr, Tr. Ry. 4–8½ g. 84 m. 9 lo. 150 c.
J. M. Ashley, *Gen. Man* ...... Ann Arbor, Mich.
H. W. Ashley, *Supt. & Pur. Agt.* do
C. C. Dodge, *M. M.* .... Ann Arbor, Mich.
Toledo, Cin. & St. Louis R. R. 3 g. 465 m. 63 lo. 2,200 c.
E. E. Dwight, *Gen. Man* .... Toledo, O.
F. W. Stewart, *P. Agt* .... Toledo, O.
L. James, *Supt. Mach* .... Toledo, O.
Tho. Robertson, *M. M.* .... Delphos, O
Toledo Div.: W. N. Moffatt, *Supt.*; and
J. G. Clifford, *M. M.* .... Delphos, O.
C. H. Mead, *Gen. M. C. B* .... Delphos, O.
S.-E'n & Dayton Div.: D. T. Bacon, *Supt.* Dayton, O.
L. Parisoe, *M. M.* .... Dayton, O.
Tonawanda Valley & Cuba and Bradford, Eldred & Cuba R. Rs. 3 g. 19 m. 1 lo. 13 cars.
L. G. Wiggins, *Supt* .... Bradford, Pa.
Toronto, Grey & Bruce Ry. 4–8½ g. 191 m 20 lo 446 c.
Edmund Wragge, *Gen. Man.* .. . Toronto, Can.
W. Watson, *Pur. Agt* .... Toronto, Can.
David Preston, *M. M.* .... Toronto, Can.
Troy & Boston R. R. 4–8½ g. 48 m. 20 lo. 484 cars.
D. Robinson, *Pres. & Pur. Agt* ...... Troy, N. Y.
Joseph Crandell, *Supt* .... Troy, N. Y.
Z. B. Davis, *M. M* .... Troy, N. Y.
R. V. Coon, *M. C. B* .... Troy, N. Y.
Tuckerton R. R. 4–8½ g. 31 m. 2 lo. 28 cars.
J. J. Pharo, *Supt* .... Tuckerton, N. J.

U

Ulster & Delaware R. R. 4–8½ g. 74 m. 10 lo. 214 cars.
Jas. H. Jones, *Supt* .... Rondout, N. Y.
Joseph Rush, *M. M* .... Rondout, N. Y.
John H. Decker, *M. C. B* .... Rondout, N. Y.
Union Pacific Ry. (5 Gen. Divs.)
3 & 4–8½ g. 4,286 m 510 lo. 10,550 cars.
S. H. H. Clark, *Gen. Man* .... Omaha, Neb.
Thos. L. Kimball, *Asst. Gen Man.* Omaha, Neb.
M. H. Goble. *Pur. Agt* .... Omaha, Neb.
I. H. Congdon, *S. M. P. & C. D.* .. Omaha, Neb
John Wilson, *Asst. do* .... Omaha, Neb.
(1) Neb. Div.: P. J. Nichols, *Gen. Supt.*. Omaha, Neb.
E. Div.: C. B. Havens, *Supt.*. .... Omaha, N. B.
R. McConnell, *M. M.* .... Omaha, Neb.
A. M. Collett, *M. C. B* .... Omaha, Neb.
St. J. & W. Div.: L. D. Tuthill, *Supt.* St. Joseph, Mo.
E. Sleppy, *M. M.* .... G. Island, Neb.
Moun. Div.: W. A. Deuel, *Supt.*. Cheyenne, W.T
J. H. McConnell, *M. M.* .... N. Platte, Neb.
R. McDougall, *M. M.* .... Cheyenne, W. T.
(2) Wy. Div.: E. Dickenson, *Gen. Supt.*. Laramie, W. T.
Laramie Div.: E. Dickenson, *Gen. Supt.* do.
T. F. Lewis, *M. M.* .... Laramie, W. T.
T. A. Davis, *M. M.* .... Rawlins, W. T.
Wes. Div.: C. E. Wurtelle, *Supt.* Evanston, W. T.
Geo. F. Chapman, *M. M.* ...... Evanston, W. T.
(3) Idaho Div.: W. B. Doddridge, *Gen. Supt.* Ogden, U.
Og. S. L. Div.:
R. Blickensderfer, *Supt* .... .. Pocatello, Id.
W. H. Lewis, *M. M.*. ...... Montpellier, Id.
S. L. & W. Div.:
W. W. Ritter, *Supt* .... S. Lake City, Utah.
U. & N. Div.:
R. Blickensdorfer, *Supt* .... Pocatello, Id.
R. Croft, *M. M.* ... . Logan, Utah.
F. Reardon, *M. M.* .... Eagle Rock, Id.
(4) Col. Cent Div.: A. A. Egbert, *Gen. Supt.* Denver, Col.
C. C. Div.: P. Toughy, *Supt* .... Denver, Col.
F. Meirtsheimer, *M. M.* .... Denver, Col.
So. Park Div.: G. W. Evans, *A. Supt.*. Como, Col.
F. Meirsheimer, *M. M.* .... Denver, Col.
(5) Kan. Div.: F. T. Smith, *G. Supt.*. Kansas City, Mo.
K. Val. Div.: J. O. Brinkerhoff, *Supt.* Kan. C'y, Mo.
Jas. Mackenzie, *M. M.* .... Armstrong, Kan.
Kan. Cent. Div.:
N. T. Kelley, *Supt.* .... Leavenworth, Kan.
Smo. Hill Div.:
O. H. Dorance, *Supt* .... Wallace, Kan.
J. B. Dailey, *M. M.* .... Ellis, Kan.
United States Rolling Stock Co. 23 lo. 4,834 cars.
A. Hegewisch, *Pres* .... New York, N. Y.
C. F. Jauriet, *Gen. M. M.* .... Chicago, Ill.
W. H. Chaddock, *Pur, Agt* .... Chicago, Ill.
Utah Central Ry. 4–8½ g. 280 m.
John Sharp, *Gen. Supt.*. Salt Lake City, Utah.
S. H. Hill, *Pur. Agt* ...... Salt Lake City, Utah.
W. B. Armstrong, *M. M.*. Salt Lake City, Utah.
Peter Reid, *M. C. B* .... Salt Lake City, Utah.
Utah & Nevada Ry. 3 g. 37 m.
W. W. Ritter, *Gen. Man.*.. Salt Lake City, Utah.
Robert Anderson, *M. M.*.. Salt Lake City, Utah.
Utah & Pleasant Valley Ry. 60 m.
G. M. Young, *Man* .... Salt Lake City, Utah.
Utica, Ithaca & Elmira Ry. 4–8½ g. 120 m. 11 lo. 152 c.
C. R. Fitch, *Supt* .... Elmira, N. Y.
C. J. Howe, *M. M & M. C. B.*. Breesport, N. Y.
Utica, & Black Riv. R. R. 4–8½ g. 180 m. 22 lo. 329 c.
J. F. Maynard, *Gen. Supt. & P. A.*. Utica, N. Y.
John Bailey, *M. M.* .... Utica, N. Y.
David James, *M. C. B* .... Utica, N. Y.

V

Vaca Vall. & Clear Lake R. R. 4–8½ g. 30 m. 2 lo. 19 c.,
G. B. Stevenson, *Gen. Supt.* .. .. Vacaville, Cal.
Valley Ry. 4–8¾ g. 59 m. 10 lo. 317 cars.
J. E. Tusk, *Supt. & P. Agt* .... Cleveland, O.
Chas. Blanchard, *M. C. B* ..... . Cleveland, O.
Vernon, Greensburg & Rushville R. R. 25 m.
Horace Scott, *V.-Pres* .... Greensburg, Ind.
Virginia Midland Ry. (*See Rich. & Dan.*)
Virginia & Truckee R. R. 4–8½ g. 54 m. 17 lo. 375 c.
Carson & Colorado R. R. 3 g. 158 m. 4 lo. 76 c.
H. M. Yerington, *Gen. Supt.* .. .. Carson, Nev.
R. J. Laws, *Supt.* (C. & Col.) .... Carson, Nev.
C. P. Mason, *Pur. Agt* .... Carson, Nev.
I. N. Fording, *M. M.*. .... Carson, Nev.
B. F. Lyon, *M. C. B* .... Carson, Nev.

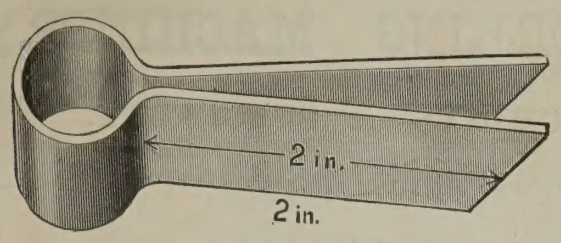
W

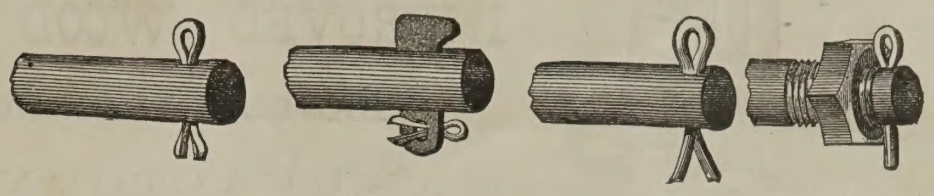
Wabash, Chester & W'n R. R. 4–8½ g. 42 m. 2 lo. 32 c
J. L. Hinckley, *Gen. Supt* .... Chester, Ill
Wabash, St. Louis & Pacific Ry. (3 Gen. Divs.)
4–8½ g. 3,241 m 598 lo. 17,230 cars.
John C. Gault, *2d V. P* .... St. Louis, Mo.
Robert Andrews, *Gen. Supt* .... St. Louis, Mo.
R B. Lyle, *Pur Agt*.. .... St. Louis, Mo.
Jacob Johann, *Gen. M. M.* ..... Springfield, Ill.
U. H. Kohler, *Gen. M. C. B.* .. .. Toledo, O.
(1) Eas'n Div.: J. B. Barnes, *M. M.* Fort Wayne, Ind.
Oh. & Ind. Div.: G. W. Stevens, *Supt.* Ft. Wayne, Ind.
Peru Div.: E. C. Murphy, *Supt.* .. .... Peru, Ind.
John McKenna, *M. M.* .... Peru, Ind.
Cairo Div.: D. G. Moore, *Supt* ... . Cairo, Ill
W. S. Morris, *M. M* .... Carmi, Ill
(2) Middle Div.: R. M. Hemphill, *M. C. B.* Peoria, Ill
Ill. Div.: H. F. Clark, *Supt* .... Springfield, Ill.
B. B. Rose, *M. C. B* .... Decatur, Ill.
Chicago Div.: E. N. Armstrong, *Supt.* Chicago, Ill
Peoria Div.: F. L. Tomkins, *Supt* ..... Peoria, Ill
Rant'l Div.: B. F. Mathias, *Supt* ..... Rantoul, Ill
J. McCarthy, *M. M.* .... Rantoul, Ill.
(3) Western Div.: W. H. Selby, *M. M.*.. Moberly, Mo
C. S. Buck, *M. C. B* .... Moberly, Mo
Missouri Div.: R. S. Miner, *Supt.* .. Moberly, Mo.
C. B & O. Div.: J. W. Blanchard, *Supt.*; and
J. S. Hazen, *M. C. B* .... Stanberry, Mo.
Quincy Div.: F. D. Schermerhorn, *S.*. Quincy, Ill.
Iowa Div.: E. Dresser, *Supt* .... Keokuk, Ia
D. Moin. Div.: H B. Skeele. *Supt.*. Des Moines, Ia
Walla Walla & Columbia Riv. R. R. (*See Ore. Ry*)
Walkill Ry. (*See N. Y., West. Sh & B.*)
Washington & Western R. R 4–8½ g. 52 m. 5 lo. 83 c.
H. McLean, *Gen. Supt* ... ... Alexandria Va
Edward Dunn, *M M.* .... Alexandria, Va.
John Harrison, *M. C. B* .... Alexandria, Va.
Waynesburg & Washington Rd. 3 g. 28 m. 3 lo. 15 c.
C. E. Bower, *Supt* .... Waynesburg, Pa.
A. M. Kline, *M. C. B* .... Waynesburg, Pa.
Welland Ry. 4–8½ g. 25 m. 3 lo. 147 cars.
William Pay, *Supt* .... St. Catharines, Ont.
Jas. Taylor, *M. M.* ... . St. Catharines, Ont.
Wm. H. Pay, *M. C. B* ...... St. Catharines, Ont.
West End Narrow Gauge Ry. 3 g. 16 m.
Rolla Wells, *Supt* .... St. Louis, Mo.
M. M. Hodgman, *M. M.* .... Florissant, Mo.
West Feliciana R. R. 4–8½ g. 27 m. 2 lo. 22 cars.
J. B. McGehee, *Pr. & Gen. Supt.* Bayou Sara, La.
J. A. Tilton, *M. M. & C. B* ..... Bayou Sara, La.
West Virginia, Central & Pittsb'g Ry. 13 m 3 lo. 19 c.
W. E. Porter. *Gen. Supt* ...... Piedmont, W. Va.
W. T. Blackiston, *Pur. Agt* .... Piedmont, W. Va.
E. W. Lippencott, *M. M. & M. C. B.*. Piedmont.
Western R. R. (of Ala.) 5 g. 88 m. 15 lo. 270 cars.
Atlanta & W. Point Rd. 5 g. 87 m. 14 lo. 206 c.
Cecil Gabbett, *Gen. Man. & Supt.*.. Mont., Ala.
C. D. Wall, *M. M.* .... Montgomery, Ala.
F. M. Wade, *M. C. B* .... Montgomery, Ala.
Western Counties' Ry. 4–8½ g. 67 m. 8 lo. 137 cars.
J. Brignell, *Supt* .... Yarmouth, N. S.
Western Maryland R. R. 4–8½ g. 157 m. 16 lo, 394 c.
J. M. Hood, *Pr. & Gen. Man* .... Baltimore, Md.
R. J. Adair, *Pur. Agt* .... Baltimore, Md.
David Holtz, *Mast. of Mach.*. Union Bridge, Md.
J. H. Nussear, *M. C. B* ...... Union Bridge, Md.
Western No. Carolina R. R. 5 g. 155 m. 6 lo. 36 c.
V. E. McBee, *Supt* .... Salisbury, N. C.
Jos. P. Minetree, *Pur. Agt* .... Richmond, Va.
G. W. Gates, *M M.* .... Salisbury, N. C.
Western & Atlantic R. R. 5 g. 138 m. 48 lo. 952 c.
R. A. Anderson, *Gen. Supt* .... Atlanta, Ga.
A. B. Bostwick, *Asst. Supt* .... Atlanta, Ga.
W. R. Webster, *Pur. Agt* .... Atlanta, Ga.
John H. Flynn, *M. M. & C. B* ..... Atlanta, Ga.
Wheeling & Lake Erie R. R. 168 miles.
M. D. Woodford, *Gen. Man* .... Toledo, O.
O. P. Dunbar, *Gen. M. M* .... Norwalk, O.
White Water R. R. (*See Ft. W., Cin. & Lou.*)
Wilmington & No'n R. R. 4–8¾ g. 77 m. 13 lo. 148 c.
J. H. Thompson, *Supt. & P. A.*. Coatesville, Pa.
George Rommel, *M. M.* .... Coatesville, Pa
Alex. Maitland, *M. C. B.* .... Coatesville, Pa.
Wilmington & Weldon; Northeastern; S. C. Central; Cheraw & Darlington; Cheraw & Salisbury; and Wilmington, Columbia & Augusta R. Rs.
5 g. 599 miles 70 locomotives 1,120 cars.
R. R. Bridgers, *Gen. Man* .... Wilmington, N
J F. Divine, *Gen. Supt* .... Wilmington, N.
John Bisset, *M. M.* .... Wilmington, N. C.
W. H. Day. *M. C. B* .... Florence, S. C.
C. R. Clowe, *M. C B.* (W. & W.). Wilmington, N. C
Windsor & Annapolis Ry. 4–8½ g. 130 m. 10 lo. 156 c.
P. Innes, *Gen. Man* .... Kentville, N. S.
Wm. Yould, *M. M.* .... Kentville, N. S.
Wm. Grierson, *M. C. B.* .... Kentville, N. S.
Wisconsin Central R. R. 4–8½ g. 480 m 49 lo. 1 608 c.
F. N. Finney, *Gen. Man* .... Milwaukee, Wis.
G. Campbell, *Pur. Agt* .... Milwaukee, Wis.
W. A. Short, *Supt. M. P. & M.*.. Stevens Pt., Wis.
Mil. & E'n Divs.: A. A. Allen, *S.*. Milwaukee, Wis.
Wis., Minn. & S. M. & N. Div.:
W. E. Carroll, *Supt.* ...... Stevens Point, Wis.
Worcester & Nashua; and Nashua & Rochester R.Rs.
4–8½ g. 95 m. 20 lo. 505 cars.
C. S. Turner, *Pres. & G. Man.* Worcester, Mass.
G W. Hurlburt, *Supt* .... Worcester, Mass.
John G. Brady, *M. M. & C. B.* Worcester, Mass.
Worcester & Shrewsbury R. R. 3 g. 3 miles.
Worcester & Somerset R. R. 4–8½ g. 10 m. 1 lo. 4 c.
J. J. Coburn, *Supt* .... Worcester, Mass.
G. E. Hapgood, *Pur. Agt* .... Worcester, Mass.
Chas. Cleveland, *M. M* .... Worcester, Mass.

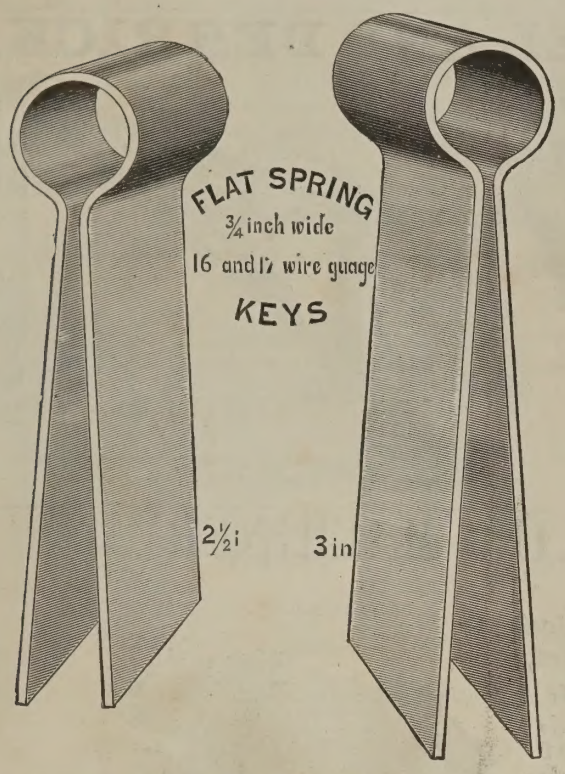
Y

York & Peach Bottom Ry. 3 g. 39 m. 4 lo. 62 c.
S. M. Manifold, *Supt. & Pur. Agt* ..... York, Pa.
S. J. Williams, *M. M.* .... York, Pa.
Youghiogheny R. R. 4–9 gauge.
Wm. Wilson, *Supt* .... Irwin's, Pa.

THE WHITMAN & BARNES MANUFACTURING CO.







Of Flat Spring Keys we can make any size or thickness required, on short notice.

SPRING KEYS AND COTTERS.
ALL KINDS AND SIZES.

WE KEEP IN STOCK ALL THE ABOVE SIZES, AND CAN FURNISH OTHER LENGTHS IF DESIRED.

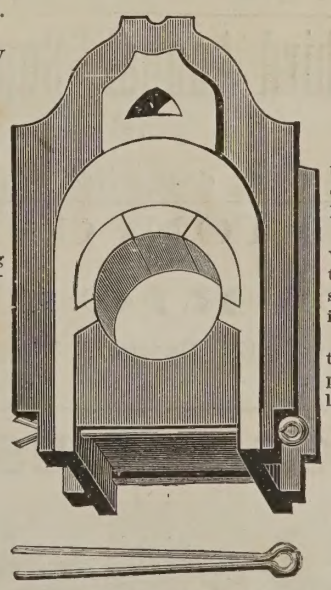
NUTS.

It is estimated that there are in the United States over 400,000 railway cars of all kinds, also 16,000 engines. These engines and cars, in traveling over the road lose annually between four and five millions of nuts. These will weigh over 1,500,000 lbs., and their cost is between $30,000 and $40,000, and this loss is continued from year to year, saying nothing of the nuts thrown into the scrap heap, with their bolts worthless from the use of the jam nut, also the liability to accident from loose nuts.—*Scientific American*, *Aug.* 30, 1879.

To avoid this enormous waste, we have for years supplied nearly all the various

RAILROAD COMPANIES,
LOCOMOTIVE BUILDERS,
CAR BUILDERS,
BRIDGE BUILDERS,
SHIP BUILDERS, ETC., ETC.

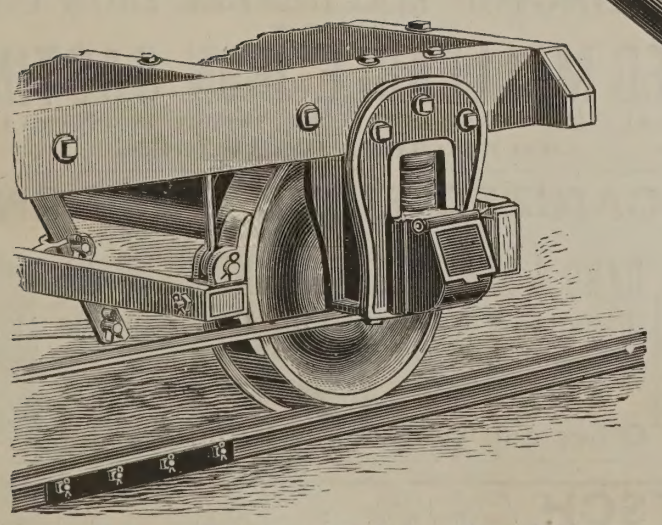
With all kinds and sizes of Round and Flat Spring Keys and Cotters, which we keep in stock or manufacture to order as they may be required.



We beg to call your attention to an improved method of holding the **CELLAR BOX** in place on locomotives.

By reference to the cut you will notice that the key passes through the entire length, and spreads just enough to prevent it from rattling out.

The use of these large cotters is approved by many prominent railroad men and locomotive builders.



The above cut illustrates a few of the various places where **ROUND AND FLAT SPLIT COTTERS** are used on cars.

MANUFACTORIES AT

SYRACUSE, N. Y. AKRON, Ohio. CANTON, Ohio.

ST. CATHARINES, Ont. BOSTON, MASS.